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MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

ABUNDANT KAZAKHSTAN SNOWFALL--Alma-Ata--Abundant snowfalls have occurred recently in the virgin land oblasts of Kazakhstan. A sharp increase has taken place in the moisture accumulation rates. Snow ridges are being arranged on one-half million hectares daily. The farmers in Severo-Kazakhstanskaya Oblast were the first to cope with their snow retention work. They are already carrying out their ridging a second time. The thickness of the accumulated snow cover here is 40-45 centimeters, enough to ensure a considerable increase in yield. [Text] [Moscow TRUD in Russian 10 Feb 80 p 1] 7026

DIFFERENT MOISTURE ACCUMULATION METHOD--Kurgan--In the northern and western rayons of the Trans-Ural region, the winter this year has been very cold and marked by little snow. Under these conditions, the conventional methods for accumulating winter precipitation are not producing the desired results. Acting upon the advice of scientists, the grain growers have begun packing the fields. Towards this end, they are placing their snow plows on iron sheets or placing in operation various types of snow packers. [Text] [Moscow TRUD in Russian 13 Feb 80 p 2] 7026

UNUSUAL SNOW CONDITIONS--Sochi--Never before had the residents of Sochi witnessed such a situation. First the sky clouded over, then snow sparkled in the air and thereafter the snow became so dense that visibility was limited to one half meter. In response to a request by a TRUD correspondent as to what caused this weather "surprise," the chief of the Sochi Municipal Meteorological Bureau, D. Lysak, stated: "This year the second half of January was by no means typical of our subtropical zone. For us, this month is usually relatively warm and calm. Quite often, surprises are produced during February. Yet suddenly, during the last half of the month, snow fell on three occasions. Yes and the cold was rather severe for our Sochi conditions: it dropped down to minus 10 degrees. And then there was this snowfall. Even the old timers cannot recall one like it. Nor has our hydrometeorological bureau ever recorded a similar situation. In a matter of just 2 hours, the snow cover reached a thickness of 20 centimeters. This unusual phenomenon was caused by an invasion of warm air masses from the

Atlantic. Before long however, we will again have warm weather and everything will begin turning green and blossoming at the resort. [Text] [Moscow TRUD in Russian 6 Feb 80 p 4] 7026

GUARANTEED HIGH YIELDS--Minsk--Complex fertilizers, the preparation recipe for which was developed at the Peat Institute of the Academy of Sciences for the Belorussian SSR, will ensure guaranteed high yields. Such granules are applied 2-3 times annually and they retain nutrients in the soil very well. [Text] [Moscow TRUD in Russian 13 Feb 80 p 2] 7026

SNOWPLOWS ON THE FIELDS--Lipetsk, 2 Feb--The recent snowfalls have enabled the oblast's kolkhozes and sovkhoses to accumulate moisture out on the fields. This work is being carried out at a maximum tempo on farms in Terbunskiy Rayon. During the past few days, snow ridging work has been carried out here on an area of 15,000 hectares. The farmers in Dolgorukovskiy Rayon are performing their tasks in an efficient manner. They are arranging their snow ridges cross-wise to the slopes, so as to prevent the spring runoff of water from pouring down into the hollows. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 3 Feb 80 p 1] 7026

FIELD TREATMENT WORK--Yoshkar-Ola, 15 Feb--Overall, more than four and one half million tons of organic fertilizers will be moved out onto the fields of farms in the Mari ASSR. Lime, phosphorite meal and 80,000 tons of ammonia liquir will be applied over large areas. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 16 Feb 80 p 1] 7026

NEW EMPHASIS ON CORN--Kherson, 15 Feb--Today there is no longer any need for proving that corn is unsurpassed among the grain crops in terms of cropping power. However, proper attention has not been given to this crop throughout the oblast, only negligible areas have been set aside for it and the yields have been low. This year the plans call for the gross yield of corn grain to be raised to 310,000 tons, or 200,000 more tons than last year. Towards this end, corn will be grown on 70,000 hectares, including 10,000 hectares on which it will be grown for the very first time using an industrial technology. At the present time, at the Ukrainian Scientific Research Institute of Irrigation Farming, exercises have been organized for the corn growers in which special attention is being given to the agricultural techniques for growing this crop under irrigation conditions. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 16 Feb 80 p 1] 7026

PREPARATION OF FIELDS--Krasnodar, 9 Feb--Warm Black Sea winds are bringing a breath of spring to the Kuban' region. The southern sun has removed all traces of the January snowstorms from the fields. Taking advantage of the thaw, the farmers have begun tending their winter grain crops. Almost one half of all of the winter wheat and barley fields -- 700,000 hectares -- has been given a top dressing of mineral fertilizers. The pruning of grapevines is being carried out on farms along the Black Sea coast in the caucasus region and on Taman' Peninsula. The farmers in Temryukskiy Rayon

have completed this work on more than 12,000 hectares, or more than one half of the overall area planned. Pre-sowing work has commenced on the piedmont fruit farms and on vegetable plantations throughout the kray. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 10 Feb 80 p 1] 7026

INCREASE IN GRAIN PLAN--Khmel'nitskiy, 14 Feb--Last year the farms in Khmel'nitskaya Oblast, notwithstanding the dry summer conditions, gathered in a fine harvest of grain crops. By introducing complex plans for raising the fertility of the soil, the farmers have concentrated special attention on the need for raising the gross yield of grain this year to 2.3 million tons. This is 185,000 more tons than the average obtained during the past 4 years. In order to achieve this high goal, the farmers sowed their winter crops on the entire area planned during the best periods and using high quality seed. More organic and mineral fertilizer was applied to the soil than has been the case in past years. In connection with the winter complex of agricultural work, the oblast's field workers are displaying special concern for the spring crops. In all areas the farms carried out their autumn plowing and all seed required for the grain and pulse crops was procured and raised to the condition required for spring sowing. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Feb 80 p 1] 7026

ORGANIC FERTILIZER APPLICATIONS--Alma-Ata--Two thirds of the task -- 1.7 million tons of organic fertilizer -- have been moved out onto the fields in Tselinogradskaya Oblast in behalf of the future harvest. More than one half of the runs were carried out by fertility brigades of Goskomsel'khoztekhnika. Approximately 13 million tons of organic fertilizer have been delivered to the fields throughout the republic. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 3 Feb 80 p 1] 7026

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POST HARVEST CROP PROCESSING

AGRONOMISTS DISCUSS CAUSES OF GRAIN LOSSES

Moscow ZERNOVOYE KHOZYAYSTVO in Russian No 11, Nov 79 pp 18-24

/Article: "How To Avoid Losses at All the Stages of the Fight for the Harvest?"

/Text/ N. Cherevko, chief agronomist of the Trust of Sovkhozes in Fedorovskiy Rayon, Kustanayskaya Oblast, Kazakh SSR honored agronomist, is especially worried about losses on the way to the elevator.

In the fight against grain losses the greatest responsibility is placed on the shoulders of combine operators, because grain must be harvested very quickly. Nature gave us few good days for grain harvesting. Therefore, the quality of preparation of equipment and the level of knowledge of machine operators play an exceptionally important role.

Before harvesting, in addition to high-quality repairs (it should be noted that new combines must also be repaired, because plants deliver them with great defects), the combine operator must seal machines hermetically and install a number of additional devices contributing to a reduction of losses and to an increase in labor productivity. During the harvesting period it must change the revolutions of the drum three or four times a day. If this is not done, not only will a great deal of grain be lost, but its quality will be lowered considerably. To change revolutions on the SK-4 combine is a whole problem. We should thank designers for Niva, in which this work can be done quickly.

Unfortunately, our combines still have a low productivity. Whereas a machine operator can sow up to 100 hectares during a work day, with a yield of more than 20 quintals per hectare the best machine operator can harvest only 25 to 30 hectares. When grain output is more than 20 quintals per hectare, basically, harvesting should be done at the first speed and even at the second lowered speed combines lose up to 3 quintals per hectare. We now urgently need a machine with which it would be possible to

harvest at least 50 to 60 hectares without losses per day. Then it will become possible to complete the harvesting in 10 to 15 days. Designers have something to think about here.

What should be done to reduce losses? First of all, it is necessary to correctly prepare the field for harvesting and to promptly mow around it and narrow strips in it. After all, if the rear sides are mowed several days earlier and then threshing is done, this means that up to 5 quintals per hectare less than envisaged are gathered on these plots (if the harvest is higher than 20 quintals per hectare). If raw grain is cut with full waxy ripeness and threshed or harvested along the edges in a straight line, the entire harvest can be lost. If mowing around the field is done on the day when grain ripens and the cross windrow is run over by combines, losses will be significant, but, nevertheless, lower than in the first two cases.

On the fields where combines can turn we cut grain into windrows without mowing around the fields. Or we make a double windrow on the day of mowing for one and a half of the harvester: during its first passage for one-half and during the second, for the full width. The distance between the grain area and the windrow is 5.8 meters. Thus, the cross windrow is preserved completely--combines do not run over it. We believe that this is the best method of field preparation.

We mow narrow strips together with cutting.

Threshing is the second stage where a great deal of grain is lost. It is necessary to begin it from cross windrows threshed by regular combine operators (they also thresh double windrows obtained when plots are laid out for tillage). Combines operate with linen pickers and are equipped with special devices, by means of which the bulk enters the thresher more evenly.

I would like to say that losses in the field are not losses. A true grain grower knows how to fight against them and solves this problem successfully. However, when grain begins its travel from the field to the elevator, sometimes it is lost, its quality is lowered and the farmer cannot eliminate the causes of this.

Drivers bring about significant losses both in the field and en route. In our rayon all trucks with grain are covered with canopies. A watch is organized on roads during the harvesting period. If scattered grain is found, it is immediately gathered and, in practice, grain losses have now been eliminated on roads. But drivers still bring about losses in the field, especially when they rush to combines and run over windrows. Drivers sent to us from the city often do this, although we hold discussions with them about the rules of work and even show them what should be done in order not to drive over windrows. It would be advisable, before sending drivers for harvesting, to do similar work with them at enterprises.

Grain cleaning on the rayon's kolkhozes and sovkhoses is mechanized almost 100 percent. This is good. However, in connection with the fact that many heavy-freight motor vehicles have appeared recently, we have nothing to unload them with. We need 15- to 30-ton dumpers. Ten-ton dumpers often get out of order (usually, we overload them), which is reflected in the rates of harvesting and, therefore, increases grain losses.

I would also like to discuss the "coded" losses of finished output, which are brought about during the determination of the quality of strong and durum wheat by procurement organizations. It should be noted that our grain receiving enterprises do not have an instrument for determining the quantity of gluten. Laboratory workers do this manually and often they underestimate it. As a rule, the quality of gluten is determined by a special instrument and in connection with this we do not have differences of opinion with grain receiving enterprises.

When the quantity of gluten in strong and durum wheat is determined (according to the instruction of the Ministry of Procurement), discrepancies of up to 2 percent are allowed. Therefore, if a laboratory worker washes out 28 percent of gluten, he can record 26 or 30 percent in documents. If during a repeated analysis 28 percent is washed out and 26 percent is recorded in documents, the court of arbitration will consider the initial analysis correct. What turns out? Production workers apply nitrogen fertilizers to areas sown with strong wheat in order to increase the content of gluten in grain by 1 to 2 percent, but according to the instructions the laboratory worker of a grain receiving enterprise with a stroke of the pen can increase or decrease its quantity by 2 percent and he will be right. In our opinion, the discrepancy during a repeated washing should be no more than 0.2 percent. This will make it possible to sharply increase the procurement of strong wheat.

The State Grain Inspectorate during a repeated washing of gluten (in case of disputable batches) should also send a document indicating its quantity (to an accuracy of 0.1 percent) not only to a grain receiving enterprise, but also to a sovkhos or kolkhoz.

Farms in Fedorovskiy Rayon deliver grain to Dzharkul'skiy, Uspenovskiy, Meshkovskiy and Leninskiy grain receiving enterprises. At the same time, there are frequent discrepancies in the grain weight determined on a farm and during acceptance. In such cases grain receiving enterprises do not recognize the weight indicated by a sovkhos or kolkhoz. Losses also occur here. In fact, no one can solve this problem.

Due to weather conditions, we often deliver strong wheat with an increased moisture and with a reduced weight per unit of volume and it is accepted as ordinary wheat despite the fact that in all other indicators it meets the standard of strong wheat. It is well known that with drying the weight per unit of volume increases and reaches the standard, the quantity and quality of gluten in grain not changing.

In our opinion, sovkhoses and kolkhoses must be the first to determine the quality of output, but for this they need good laboratories. When grain arrives at a grain receiving center, its quality is determined once again. If there are discrepancies, the rayon state inspectorate for procurement and quality, which must also be equipped with a laboratory, should draw the final conclusion. This will help to organize quality control and to stop the disputes between production workers and procurement officers and, therefore, to lower the losses of finished output.

A. N. Shcherbatyy, chief agronomist of the Administration of Agriculture of the Tal'novskiy Rayon Executive Committee of Cherkasskaya Oblast, calls the variegation in the yield and shortcomings in the operation of equipment "invisible" losses.

In 1978 the gross output of grain on the rayon's farms totaled 133,600 tons. In its yield (39 quintals per hectare) and gross output we exceeded the level planned for 1980 for 2 years in succession. However, our specialists believe that the minimum norm of grain production in the rayon is 140,000 tons. A skillful preservation of the grown harvest can greatly help to obtain such a quantity of grain.

Usually, we talk about visible losses. However, there are also other losses, whose elimination would make it possible to sharply increase grain production. For example, we lost a great deal of grain by disrupting the technique of cultivation on individual farms, in brigades and in links, as a result of which a great variegation in the yield is observed. For example, last year, while its average rayon level was 39 quintals per hectare, it was the highest on the Zdobutok Zhovtnya Kolkhoz managed by T. A. Gavrilova, Hero of Socialist Labor, deputy of the Ukrainian SSR Supreme Soviet. A total of 44 quintals per hectare were gathered on an area of 1,694 hectares. On the Pravda Kolkhoz, whose land in terms of fertility is not inferior to the land of the Zdobutok Zhovtnya Kolkhoz, the yield of grain crops on 1,300 hectares totaled only 34.1 quintals per hectare, that is, it was almost 5 quintals per hectare lower than the average rayon yield and 10 quintals per hectare lower than on the Zdobutok Zhovtnya Kolkhoz. The Pravda Kolkhoz lost 650 tons of grain, as compared with the average rayon indicators, and 1,300 tons, as compared with the Zdobutok Zhovtnya Kolkhoz. Therefore, pulling up lagging farms to the level of advanced farms is the main task of the rayon party committee and of the executive committee of the soviet of people's deputies. We intend to completely eliminate the variegation in the yield by the end of the five-year plan.

The preservation of sown areas is the second important way of reducing grain losses. The point is that, owing to a number of objective and subjective reasons, part of the areas of grain crops on farms are harvested for fodder. For example, last year we sowed grain crops on 36,900 hectares and harvested them for grain on only 34,200 hectares. If we had

preserved and harvested these 7,700 hectares for grain, not for fodder, we would have had an additional 10,800 tons of grain and its gross output in the rayon would have totaled 144,400 tons. Are these not losses?

It is very important to solve the problem of reducing losses during the harvest growing period. Winter wheat is the basic grain crop in our rayon. We annually harvest it on an area of 15,000 to 16,000 hectares. Last year we gathered an average of 47.2 quintals per hectare. This is not bad, but it can be stated with confidence that, according to the harvest outlook, we could have obtained no less than 52 to 55 quintals per hectare. We lost a considerable part of the harvest during the grain farming period. Many crops lodged and grain did not form properly. A shortage of 5 to 6 quintals per hectare was the result of this. We consider the nonresistance of regionalized varieties (Odesskaya 51, Dneprovskaya 775, Il'ichevka, Akhtyrchanka and others) to lodging the main reason. Almost all of them do not withstand a high agricultural background. We use the tar preparation, but it is not always of help, especially on such predecessors as grass and peas.

We need varieties that do not lodge with a harvest of 60 to 70 quintals per hectare. Some work in this direction is done at the All-Union Selection and Genetics Institute (Odessa), but very slowly. Science lags behind the increased demands of production.

There is a similar picture with regard to spring crops, especially barley, which occupies 6,000 to 7,000 hectares in our rayon.

Now we would like to discuss the reduction of losses during harvesting. We pay principal attention to the prompt preparation of equipment. As a rule, at the beginning of sowing grain harvesting combines and reapers already stand on the line of readiness. Before harvesting a special commission inspects the equipment, accepts it according to documents and gives permission for its operation. During acceptance special attention is drawn to the elimination of possible losses: Windscreens are increased and the tightening of reapers, threshing drums, screw conveyers and other parts is checked. However, our plants should pay more attention to putting combines into operation straight from the conveyer. As a rule, a new machine must be almost completely taken apart, figuratively speaking, all of it must be "felt," every part and unit must be adjusted and only after this can it be put into operation. Evidently, volume still prevails over quality at plants, while the reverse should be true.

The fact that with a yield of 50 to 60 quintals per hectare we lose 10 to 15 percent of the harvest is the main shortcoming of harvesting equipment. A thresher does not ensure quality threshing, especially heap separation. In order to lower the load on it, machine operators should reduce the width of cut. With direct combining this succeeds to some degree, especially during the operation of a combine with a grinder, when the field

remains clean. However, with swath harvesting--we harvest 60 to 70 percent of the grain by this method--it is not always possible to solve this problem. Often we have to put grain into a windrow from a strip of 2.5 to 3 meters wide. However, the width of cut of combine harvesters and headers does not make it possible to form such windrows, the unit not "fitting" into the interwindrow space. Therefore, combine operators must manifest the maximum skill and ability in order to thresh a windrow from a 4-meter strip with minimum losses. Lower speeds, variation of speeds with the clutch and so forth are used. As a rule, the desired result is not attained and losses exceed the permissible losses.

Under the conditions of our rayon it would not be bad to have harvesters for swath harvesting with a width of 3 meters and special pick-up attachments with the same width of cut mounted directly on the combine, not on the harvester. PPT-3 and SK-3 would be suitable for this if it were possible to mount them directly on the combine with a removed harvester, not on the combine harvester. Of course, it would be good to have a combine with a heap capacity of 8 to 10 kg/f and a normal width of cut.

We bring about great losses during the harvesting of lodged grain. Windrow harvesters with a width of cut of 4.9 to 6 meters poorly gauge the field relief and a considerable part of the grain is not cut, or only ears are cut, which a pick-up attachment does not pick up efficiently. The ZhNU-4 rice harvesters produce a very good effect during the harvesting of lodged grain, but we do not receive them according to orders.

I believe that it is necessary to deliver windrow harvesters with a 3-meter width of cut and combines with a width of harvester cut of no more than 3.2 meters to farms in the central zone of the Ukraine. For some reason our industry manufactures only wide-cut windrow harvesters.

Fighting against losses during harvesting, we rejected the figured method of grain cutting, when the harvester approaches from the edge of the field and along the spiral puts grain into windrows on an area of 100 to 150 hectares. Before the beginning of harvesting, we mow the field from two sides by direct combining so that the width of the strip may make it possible for the harvesting unit to turn. We establish a size of the plot for tillage that is optimal for its operation with due regard for the smallest loss of time on turns. We mow it from two sides. This makes it possible to assign a separate plot for tillage to each combine.

We bring about great losses of grain by prolonging harvesting time. Our farms have 195 combines. The load on each combine totals 150 to 160 kg. It would seem that this is not much, but with a yield of 40 to 50 quintals per hectare under our conditions daily output totals 8 to 10 hectares. As a result, the harvest campaign lasts 15 to 20 days. Grain put into windrows loses 10 to 15 percent of its weight and the quality of threshing,

especially of heap separation, is lowered, which greatly increases losses. Therefore, I believe that the normal load per harvesting unit in our rayon is 100 hectares.

Harvesting time is also prolonged, because the size and configuration of our fields do not make it possible to utilize harvesting equipment at full capacity (the average size of a field is about 100 hectares and there are many slopes). A great deal of time is also lost through the fault of machine operators. In our rayon grain unloading in motion has not yet become law and long periods between shifts and empty crossing are tolerated.

In order to lower losses during grain transportation, on the motor vehicles that transport grain the sides are increased by 15 to 20 cm, tarpaulin or burlap canopies, with which grain is covered, are made for each side and roads are improved.

Under the conditions of the rayon, as a rule, harvesting takes place during dry weather and grain with an increased moisture has arrived at threshing floors only in the last 2 years. It should be stated that these 2 years have taught us a great deal. We are now engaged in extensive work on the construction of covered threshing floors and we warehouse threshed grain only on asphalted sites (12 out of 21 farms have already built covered threshing floors and there are 28 asphalted sites).

We pay much attention to a prompt cleaning of grain. Kolkhozes have 26 powerful grain cleaning complexes and one-half of them have dryers. This makes it possible to initially process grain immediately after threshing. As a rule, it does not lie on threshing floors for a long time. Immediately after cleaning and drying (if this is necessary) it is delivered to a grain product combine or stored in warehouses.

"The disproportion in the structure of sown areas leads to a shortage of 9,000 to 10,000 tons of grain," states I. G. Silenko, chief agronomist of the Administration of Agriculture of Pervomayskiy Rayon in Nikolayevskaya Oblast.

The annual plan for grain production in our rayon is 148,800 tons. However, in 3 years of the 10th Five-Year Plan we did not fulfill it. The average annual output was only 134,500 tons, or 90.5 percent of the plan.

Is what do I see the basic reasons for the nonfulfillment of the plan for grain production?

First, the imperfect structure of sown areas.

In the rayon there is the stock seed breeding Sovkhoz imeni 25 Oktyabr' and the Migeyskiy Sovkhoz Tekhnikum, whose crop structure is worked out and approved by the Ukrainian SSR Ministry of Agriculture so as to ensure

a full mastering of crop rotations. Prior to 1978 a total of 80 percent of the area of bare fallow available in the rayon was concentrated on these farms and, for example, grain crops comprised 47 percent of the arable land on the Sovkhoz imeni 25 Oktyabr'. Furthermore, three sheep breeding kolkhozes, a farm for fattening 7,000 head of cattle and a farm for breeding 7,000 head of heifers were established in our rayon. Each of them tries to increase the areas of fodder crops by reducing the areas sown with grain crops. This introduces a disproportion into the structure of sown areas in the rayon. For example, whereas grain crops on the stock seed breeding Sovkhoz imeni 25 Oktyabr' occupy 47 percent of the area of arable land, on sheep breeding kolkhozes, 50 percent, on the specialized Rassvet Farm for cattle fattening, 28 percent and on the specialized Vol'nyy Farm for heifer breeding, 47 percent, on the remaining kolkhozes and sovkhoses, 59 to 57 percent. Thus, on some farms there are good predecessors for grain crops, in particular for winter grain crops, while on others they have to be sown after cereals for 3 or 4 years in succession and no more than 14 to 16 quintals per hectare are obtained. As a result, the shortage of grain amounts to 9,000 or 10,000 tons.

A plan for intrafarm organization was developed for all kolkhozes and sovkhoses in the rayon. According to this plan, grain crops in crop rotations should occupy 47 percent of the arable land, 70 percent being assigned to winter crops. After the area of the former has been increased to 51,700 hectares, instead of 45,400 hectares according to the crop rotation scheme, winter crops still comprise 70 percent of their sown areas. As a result, every year we place 6,300 hectares of winter crops on poor predecessors and sometimes we sow them on poorly prepared soil after the optimum time. As a rule, in the spring we resow all these areas with spring barley. Each resowing represents a shortage of 3 to 4 quintals of grain per hectare plus a loss of seeds of winter crops (2.5 quintals per hectare). On the entire area losses amount to 3,000 or 4,000 tons.

In the stock seed breeding Sovkhoz imeni 25 Oktyabr', where it is possible to observe crop rotations efficiently, the harvest of grain crops is always 8 to 10 quintals per hectare higher than the average rayon harvest. The areas sown with grain crops on this farm are 894 hectares smaller than on the Kolkhoz imeni XXII S'yezda KPSS and the gross output of grain is 868 tons higher.

Owing to the imperfect structure of sown areas, the rayon annually loses a total of 12,000 to 16,000 tons of grain.

Disruption in the technique of grain crop cultivation, in particular a poor preparation for sowing, inferior execution of sowing, prolongation of the periods of field work and untimely, protracted harvesting, is the second important reason. Why is this so?

The low level of operating reliability of repaired tractors and combines and the poor organization of their technical servicing in the field are

the main reasons. Tractors in need of repairs cannot operate in a hitch with two KPG-3 cultivators with a soil cultivation depth of 5 to 6 cm and, if they operate, their productivity is two-thirds to one-half of the norm. In addition to this, they often are idle during the peak of work. This is the result of the fact that the enterprises of the State Committee on Agricultural Equipment after repairs test only engines for power and specific fuel consumption and are not interested in finding out whether the tractor develops power at the hook according to its technical specifications and what its operating reliability is.

Nor does the quality of repairs of simple agricultural machines and implements meet technical specifications. Therefore, the agronomist must consciously simplify agricultural practices and put up with semiflaws in work in order to perform the required volume of work even if it has some (and at times significant) shortcomings and to obtain a harvest, even if it is low.

There is a similar situation during the harvesting period. A total of 8 to 10 work days are its optimum time, but, in fact, the harvest campaign lasts about a month, not because we organize work inefficiently, but because combines do not pass the amount of bulk grain stipulated by their technical data through the thresher. If as much bulk as envisaged by the design is put into the thresher, it is either clogged up or the separating elements have no time to process the heap and grain losses increase to 30 percent. Therefore, combines operate at half the capacity and harvesting periods are prolonged 1.5- to 2-fold and during bad weather, even more.

Basically, the reduction in the output of harvesting machines is not the result of design shortcomings of machines (although they do exist), but of their inferior repairs and the inability to adjust the entire machine, not its individual units.

In the last few years we have tried to improve the quality of equipment repairs, purchased an additional number of grain harvesting combines and restored written off combines with a view to increasing the load per unit to 130 or 140 hectares (at present 200 to 220 hectares). The experience of the stock seed breeding Sovkhoz imeni 25 Oktyabr' indicates (on it a combine accounts for 120 hectares of cereals and pulse crops) that with a load of 130 to 140 hectares per unit we will be able to complete the harvest campaign in 8 to 10 work days and, as a result, to reduce grain losses by 4 to 5 quintals per hectare, or by 10,000 to 18,000 tons.

High-yielding varieties tend to lodge. This is of the greatest concern to G. A. Belov, chief agronomist of the Order of the Badge of Honor Experimental Training Farm of the Ul'yanovsk Institute of Agriculture and to his fellow workers.

The existence of losses and their amounts is due to several reasons, which depend and do not depend on the results of farm activity.

We consider the prolongation of harvesting time the basic factor. In this case losses are caused by the natural shattering of grain (millet, buckwheat and oats), breakage of the ear (barley), bending of ears to the ground below the operation of the cutting apparatus of a harvesting machine (winter rye, oats and barley) and cracking of beans (peas and vetch). In the fight against losses, owing to these reasons, the maximum shortening of harvesting time as a result of a highly productive utilization of equipment following the experience of Ipatov grain growers and the use of the swath method of harvesting are the most important. When grain is put into windrows during the period of waxy ripeness the yield is not lowered. If grain is put into loose windrows and hangs well on a stubble field during a long delay in threshing and frequent rains, grain does not lose its commodity and seed qualities.

Ours is a stock seed breeding farm. We service all Ul'yanovskaya Oblast, annually selling up to 110,000 quintals of seeds of winter crops of high reproductions. The agricultural background of grain crop cultivation is high. Our farmers receive 40 quintals per hectare and more. And here the greatest concern begins. The point is that, in practice, all varieties possessing a high yield potential tend to lodge. The Mironovskaya 808 winter wheat, Dneprovskiy 220 barley, Saratovskaya 4 winter rye, Saratovskaya 41 spring wheat, Volzhanka and even the Astor oat variety famous for this characteristic are no exceptions. During all the 25 years of my work I have never harvested standing grain with a high yield level.

The state strain testing service offers highly productive varieties for production and this attracts farmers, but ignoring the lodging point, which we always do, leads to deplorable results. A highly productive, new variety of the Kutulukskaya spring wheat is right now being introduced in our oblast, but in 1978 on strain testing plots its crops lodged completely, nor was this wheat noted for resistance to lodging during previous years.

In order to lower the lodging of grain, we widely apply the tur preparation (we treat seeds and spray crops during the phase of the beginning of shooting), but for the time being the results are not comforting. All this leads to a sharp reduction in the productivity of combines and eliminates such harvesters as ZhRS-4,9 from harvesting work, which leads to the prolongation of harvesting time and predetermines additional losses.

The problem of breeding short-stem varieties of grass crops is not new and scientists are solving it (true, at quite slowed rates). Apparently, however, the state inspectorate for strain testing should make greater demands on the acceptance of varieties for testing on the basis of lodging.

we incur great losses owing to the lack of highly productive combines. The Kulis combine often operates unproductively even in the hands of the best combine operators. It is very unreliable in operation and stands more than operates on fields. The Niva combine is unproductive when it harvests a yield of 40 quintals per hectare and more. It has to operate constantly at the first gear with the lowest range. If the threshing apparatus copes with the threshing, owing to the inferior operation of the straw shaker a great deal of grain is lost with straw and, moreover, the separating part together with the sieve boot does not cope with its flow efficiently.

The new 'Vityaz' combine with a mass capacity of up to 12 kg/f is now being developed. It would be very advisable for designers to fully guarantee the separation of grain from straw, chaff and impurities with its maximum loads.

During the harvesting of high-yielding grain often it is necessary to reduce the width of cut of harvesting units so that windrows may dry more rapidly and be suitable for the operation of our low-capacity combines. In particular, this has to be done often during the harvesting of winter rye. During the passage of the free part /progal/ of the harvester bulk grain falls out in front of it, not reaching the windrow, and some ears are undercut by a knife. We used additional belts on reel blades and covered the free part of the finger bar with iron, but could not reduce the losses to a minimum.

It is advisable for our industry to partially supply harvesters with a changing width of cut or like the ZhVN-10 harvesters, but with a smaller general cut (on the order of 8 meters) and with placement into two windrows. It is necessary to manufacture special harvesters for harvesting lodged grain with a lowered height of cut and with a special mechanism for lifting the bulk before it is cut and taken up by reels. Such a variant is also needed for the ZhRB-4,2 harvester, because it poorly gauges the height and grain lifters often rise higher than the lodged grain.

The KIN-3,1 mowers are still used in the mowing of pulse crops. They operate much better than the ZhRB-4,2, but tread on windrows, although they operate on a narrow track. Especially many windrows are treaded on during mowing in windy weather. If the industry continues to manufacture them, it is advisable to increase the width of cut of these mowers to 2.5 meters. It should also be noted that the ZhRB-4,2 harvesters and the KIN-3,1 mowers cut up many pods. These losses have already been established, as it were. However, if harvester reels are made 15 to 20 cm wider than the cutting apparatus in the direction of the unmowed mass, they will lift plants up to the knife and it will be possible to avoid the undercutting of pods. An outside divider (as in the ZhZN-6 harvester) can be installed on mowers, which will also reduce the undercutting of pods.

"A uniform application of organic fertilizers and a prompt strain change will ensure an increase in harvests," believes V. S. Barabash, chief agronomist of the Administration of Agriculture of the Novovodolazhskiy Rayon Executive Committee in Khar'kovskaya Oblast.

In the rayon in the last 3 years the harvesting of early grain crops has taken place under very complex weather conditions, as a result of which almost all winter and spring crops have lodged. In our opinion, there are two reasons for this--the nonuniform application of organic fertilizers and the weak resistance of the varieties in production to lodging.

Agrochemists recommend that we apply 25 to 30 tons of organic fertilizers per hectare of fallow. However, transport facilities with a carrying capacity of 7 to 10 tons and more cart them out on farms. When rotor spreaders are used, it is not possible to uniformly distribute these three or four manure heaps over 1 hectare. It turns out that we apply either too little or too much manure to soil. Both lead to the lodging of winter wheat. With mobile spreaders (there are very few of them on the rayon farms) it is possible to apply organic fertilizers more uniformly, but they too cannot operate with heavy freight tractor facilities and, furthermore, do not operate efficiently during rainy weather. To some extent it is possible to equalize the correlation of nutrients in soil and on this basis to weaken the lodging of crops by means of phosphorus and potassium fertilizers. However, the stocks allocated to us do not make it possible to do this. Under the conditions of a cool and rainy summer the tur preparation does not produce the proper effect either.

The following examples show how much grain is lost during the harvesting of lodged grain. Three winter wheat varieties, that is, Mironovskaya 808, Severodonskaya and Akhtyrchanka, were sown on fallow on the Kolkhoz imeni Lenin. Mironovskaya 808 greatly lodged even before grain formation and the two other varieties lodged much less. Other things being equal, on the average, 35 quintals of Mironovskaya 808, 51.6 quintals of Severodonskaya and 53.2 quintals of Akhtyrchanka per hectare were threshed. The Khar'kovskaya 81 winter wheat was sown on an area of 10 hectares on the Sovkhoz imeni Komintern. It did not lodge at all and its yield exceeded 70 quintals per hectare. Therefore, a prompt strain change in combination with good agricultural practices is an efficient method of controlling harvest losses.

A correct correlation between swath harvesting and direct combining is the most important condition for lowering biological and physical grain losses. Under our conditions it changes depending on weather conditions that is, in rainy weather we reduce the proportion of swath harvesting and give preference to direct combining. Nor do we swath harvest grain whose height after mowing does not exceed 50 cm: Such a windrow is not picked up well.

When grain is mowed with harvesters, stems should be put into a windrow at a small angle to its longitudinal axis. Stems placed along a windrow are not picked up well by a pick-up.

Nevertheless, the main losses occur during the operation of combines. There are many reasons for this, beginning from big loads of harvesting areas per combine and ending with the preparation of fields and combines for operation, setting of the harvester, pick-up and thresher of a combine, selection of the speed of its motion during threshing and so forth.

A total of 186 combines harvested early grain crops on the rayon farms last year. The average load per combine was 180 hectares with fluctuations from 150 to 220 hectares. On one-half of the farms it exceeded 190 hectares. This became the reason for the prolongation of harvesting time and for considerable harvest losses. We set ourselves the task of increasing the load per grain combine to 150 hectares. However, our orders for these machines have not been fully met in the last 3 to 4 years.

The quality of the combines themselves has a significant effect on an increase in harvesting losses. Presently manufactured machines have 12 points of basic losses and approximately the same number of secondary losses. Our machine operators must eliminate the flaws of designers and combine builders under production conditions. Furthermore, the grain combines arriving from the plant require a check of all fastenings. Before this they cannot be run in, because they will fall apart. Much time is spent on such an operation (very often combines arrive on a farm on the eve of the harvest). Last year on the SK-5 No 259 091 combine the delivery auger shaft was bent, misalignment of the rear countershaft drive tensioner was disclosed, the cabin did not fit the opening, the pick-up springs were not fastened and the harvester driving belt was stretched. On the SK-5 No 242 964 combine the thresher clutch was not connected, the fastenings of the flight of stairs did not match, the tensioner was jammed and the tachometer drive was twisted. On the SK-5 No 254 158 combine there was a crack in the fuel tank, the pulleys of the harvester speed reducers were misaligned and there was no cock for draining water off the radiator. Many similar examples can be cited. Combine builders have already become used to this and do not pay any attention to our signals.

I would also like to discuss the need to increase the capacities of drying units at grain receiving enterprises. In the last few years, which have been rainy, grain has arrived from the field with a moisture of more than 30 percent. It cannot be stored on threshing floors and we stop the combines. Harvesting time is delayed and harvest losses in the field rise.

The responsibility of designers and machine builders for the production of improved agricultural equipment should be increased. This is the opinion of A. G. Yenikeev, chief agronomist of the Administration of Agriculture of the Dyurtyulinskiy Rayon Executive Committee of the Bashkirskaya ASSR.

For many years our rayon has obtained stable and high grain harvests. The year 1978 was especially successful. During that year, on the average, we gathered 30 quintals per hectare and stored more than 70,000 tons in the homeland's granaries. However, its output could have been even greater if not for the losses, against which we do not yet always fight successfully.

Every year the rayon receives more and more refined equipment. Before combines go out to the field, they are carefully sealed hermetically, on special sites a certain amount of grain is passed through them and, if losses are disclosed, all the shortcomings in their operation are eliminated. If there are no losses and a combine is suitable for operation the combine operator is allowed to harvest. However, this does not yet mean that grain losses are completely eliminated, because all farms deal differently with hermetic sealing. Therefore, it is necessary to hermetically seal grain combines according to a uniform system at the plant.

Our combines are capable of threshing grain with a yield of 18 to 22 quintals per hectare fully and without losses. However, if the yield is higher, the threshing is incomplete. Therefore, it is necessary to increase the capacity of grain combines (especially SK-5 and SK-6).

Another circumstance prevents us from fighting against losses. In the rayon there are only 133 harvesters and the load is 70 hectares per each. With a norm of 10 hectares per unit 7 days will be needed to mow pulse crops, but according to agrotechnical requirements no more than 3 or 4 are needed. The shortage of bean harvesters leads to a partial shattering of pods before and during windrowing. Therefore, the industry should increase their output and make them more productive and refined.

Considerable grain losses occur during postharvesting processing. On our farms there are few highly productive grain cleaning and drying units and we do not have time to promptly clean and dry the grain arriving from the field. Owing to this, on some kolkhozes during the wet year of 1978 grain waste was spoiled. Only owing to the selfless labor of kolkhoz members was it possible to fully store seed and fodder stocks. It is necessary to better provide kolkhozes with grain cleaning and drying units.

Of course, in the fight for increasing grain production machine operators make different attachments for combines and harvesters, home-made dryers and so forth. Without the help of industrial enterprises kolkhozes cannot cope with this problem.

However, losses are observed not only during harvesting. For example, some kolkhozes, owing to the shortage of sowing machines, greatly prolong sowing time and this also leads to a reduction in the harvest. A total of 38 sowing complexes, in which 150 sowing units operate, have been established in the rayon this year. Each of them accounts for 420 hectares. To reduce the load per sowing machine and to sow in a shorter time, we must obtain about 20 sowing units more.

Thus, we believe that equipping agriculture with improved machinery, which is designed with due regard for the characteristics of various crops and the causes of harvest losses is the basic way of controlling grain losses.

"As you sow, so shall you reap," M. A. Vorontsova, chief agronomist of the Production Administration of Agriculture of the Peschanokopskiy Rayon Executive Committee of Rostovskaya Oblast, rephrased the popular saying.

We wage the fight against losses at all the stages of cultivation of grain crops, among which winter wheat is the basic crop. We place it on the best predecessors and prepare fields in advance.

We sow winter crops on well-leveled soil in the direction from east to west, which makes it possible to reduce ear losses during harvesting (during the haying season some of the ears placed along rows remain on the ground). We sow spring barley in precisely the same way.

It is well known that the harvest largely depends on varieties. It is difficult to know in advance for which of them the conditions will be more favorable. Therefore, we grow two or three varieties of both winter wheat and barley. For example, on some farms in the fall of 1978 there were more favorable conditions for the sowing of the Rostovchanka winter wheat. Three farms sowed at the end of the optimum time and, therefore, the Severodonskaya wheat occupied large areas there. We cultivate two varieties of spring barley in precisely the same way. We sow only first-category seeds of high reproductions with a simultaneous application of 30 kg of superphosphate per hectare to rows.

The grain growers of our rayon initiated the movement for the production of high harvests of all crops in the oblast. This spring the sowing of early grain crops was completed in 70 hours on an area of 30,600 hectares with an excellent quality of all field work.

This spring was unusual. For example, in the last 10-day period of February and at the beginning of March during the day the temperature was positive and at night frost reached -7° . The frequent freezing and thawing of soil caused a great loss of the winter crops that were not fully tillered and they had to be resown with spring crops. The crops preserved until the beginning of spring sowing were topdressed by surface and root methods.

The agronomical service of the rayon has established the strictest control over the uniformity of depth of seed embedding, because the nonsimultaneous ripening of ears in the tract of land leads to a shortage of 1.5 to 2 quintals of grain per hectare. That is, one can rephrase the popular saying, stating "as you sow, so shall you reap."

In the fight for the harvest we treat all crops with toxic chemicals against rodents and with herbicides against weeds. It is important to apply herbicides on time. If we begin to treat crops with them before tillering, plants are inhibited and, if we do this at the shooting phase, the harvest can be lost as a result of the smaller number of grains in the ear. Therefore, the tillering phase is the best time for crop treatment.

We consider the period when grain moisture reaches 38 to 40 percent the beginning of the mowing season. A special group of people headed by the chief agronomist observes the ripening of grain on every farm. Samples for determining moisture are taken twice a day. This makes it possible to correctly establish the beginning of harvesting.

We draw up the work plans for the harvest immediately after sowing. Every one knows in advance where and on which combine, machine or tractor he will work.

We harvest grain by the group method with harvesting complexes.

"Overstating seeding rates leads to an overexpenditure of seeds and lowers the yield," says Ye. Ya. Berlinberg, chief agronomist of the Production Administration of Agriculture of the Kalacheyevskiy Rayon Executive Committee of Voronezhskaya Oblast.

We begin the fight against losses from storing only first-category seeds. The sowing of such seeds (250,000 quintals) annually saves us more than 12,000 quintals of grain. Furthermore, the harvest increases by 2 to 3 quintals per hectare.

A correct sowing rate is another, no less important, potential for the fight against grain losses. For this purpose in all tractor brigades it is established in advance and a pattern for each sowing machine is cut out. According to it the correctness of sowing is checked in the field.

Farms also draw serious attention to a correct arrangement of sowing machines at the hitch. Sometimes agronomists, in order to insure themselves against gaps in sowing, in the spaces between sowing machines make an overlap of two or three plowshares, which leads not only to a useless loss of grain, but also reduces the harvest owing to the crowdedness of crops in these places and complicates harvesting. In such a case it turns out that more seeds are sown, but a smaller harvest is obtained.

Many losses occur when sowing is incorrectly carried out along the edges of fields. A firm rule was established in Kalacheyevskiy Rayon. As long as headland is not cleared in the field, the machine does not begin sowing. The width of headland is three passages of the machine. Ignoring this simple rule of agricultural practices leads not only to unnecessary grain losses, but also to the crowdedness of crops at the edges of fields, which causes lodging.

The control of pests, diseases of agricultural crops and weeds is one of the serious problems. Previously, various harmful pests, especially pentatomids, did great damage to crops. Together with the specialists of the rayon plant protection station we developed and implemented a set of measures for controlling them. We paid special attention to detecting and destroying them at the first phase of development immediately after the end of wintering. This produced good results.

A considerable increase in the application of herbicides contributed to the control of weedy vegetation. This work is especially effective on barley crops. It can be stated with confidence that with this we preserved up to 10 percent of the harvest.

Before harvesting a commission inspects every combine and every combine operator is given permission to operate a combine. Furthermore, all combine operators receive a "coupon of quality" and "Instructions for the Combine Operator." The instructions contain "A Handbook for Setting and Controlling Combine Operation" prepared in the form of a dial, which makes it possible to rapidly select the correct operating conditions and to set the machine.

The selection of the harvesting method is a decisive factor in the fight against losses. Both swath harvesting and straight combining are widely used in our rayon.

Especially big losses are observed in the harvesting of peas. A delay of 4 to 5 days in mowing them leads to a loss of one-half of the harvest. Our specialists and machine operators took this into consideration. We now begin to mow peas when 30 to 40 percent of the pods become yellow. As a result, the harvesting time was shortened in one-half and the losses were reduced to a minimum. The same farms that delay harvesting, waiting for 60 to 70 percent of the pods to ripen, as a rule, obtain a low harvest.

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LIVESTOCK FEED PROCUREMENT

COOPERATION IN PRODUCTION, PROCESSING OF FEED

Saratov STEPNYYE PROSTORY in Russian No 8, Aug 79 pp 58-59

[Article: "On the Development of Specialization and Inter-Farm Cooperation for the Production and Processing of Feeds"]

[Text:] In the oblasts, krays and autonomous republics of the RSFSR there are now 87 inter-farm enterprises, 83 specialized enterprises on feed production and over 330 inter-enterprise mixed-fodder plants and shops. Their operational experience shows that in inter-farm enterprises and specialized enterprises as a rule there is a high yield of cultivated crops, the volume of feed production increases each year and feed lands and irrigated lands are used effectively. Thus, in the Korma inter-farm enterprise of Peremyshl'skiy Rayon, Kaluzhskaya Oblast, which was organized in 1972, purposeful measures have been realized to raise the fertility of floodlands. Through the joint efforts of member farms a modern material-technical base was created for the procurement, storage and processing of feed. As a result last year over 9,000 tons of feed units were procured here, including 570 tons of hay, 7.4 tons of haylage, over 23,000 tons of silage, and 3,000 tons of grass meal and mixed fodder. In comparison with 1972 procurement increased in the rayon: silage--by 42 percent, haylage--by 3, grass meal--by a factor of 9.5. Effective work is being done by the inter-farm enterprises Poyma of Tul'skaya and Vladimirskaia, Bezhanitskoye of Pskovskaya, Izhimskoye of Tyumenskaya, Kalininskoye of Rostovskaya oblasts and many others.

In Tambovskaya Oblast the Sovkhoz imeni 60-Letiya VLKSM, which is specialized on an inter-enterprise basis, in 1978 produced 25,100 tons of feed units. During the last 6 years the productivity of a hectare of feed lands has increased from 17.5 to 59.5 quintals of feed units. The cost of green fodder and silage has decreased by half and of grass meal--by a factor of 1.5. High production-economic indicators have been achieved by the specialized enterprises on feed production--the Rossiya and imeni Shevchenko kolkhozes of Chelyabinskaya, the Nizhnekuslyayskiy Sovkhoz of Voronezhskaya oblasts, the Novyy Put' Kolkhoz and the Sveklovichnyy Sovkhoz of Mordovskaya ASSR and others.

At the same time there are instances in which agricultural organs use the possibilities of specialization and inter-enterprise cooperation in feed production poorly and do not take the necessary measures to give this branch a more specialized nature. In particular this refers to Arkhangel'skaya, Ivanovskaya, Kalininskaya, Ryazanskaya, Smolenskaya, Yaroslavskaya, Kurskaya, Ul'yanovskaya, Sverdlovskaya, Kemerovskaya, Novosibirskaya, Tomskaya and Amurskaya oblasts, to Altayskiy, Krasnoyarskiy and Primorskiy krais and to the Kabardino-Balkarskaya, Severo-Osetinskaya and Komi ASSR's.

In the republic as a whole in 1978 the capacity of inter-enterprise mixed-fodder plants and shops was loaded to a little more than half, and in Kaluzhskaya, Ryazanskaya, Yaroslavskaya and Ul'yanovskaya oblasts and Bashkirskaya ASSR 20-30 percent of the capacities were utilized. In Kostromskaya, Vladimirskaya and Pskovskaya oblasts the figure was even smaller--5-10 percent. The reason for this was the shortage of feed protein and other highly valuable supplements.

The building of meat-bone meal plants is proceeding unsatisfactorily in the republic.

The supplies of technological transport and equipment to inter-farm enterprises are poor. In many oblasts, krais and autonomous republics there are unsolved problems concerning the complex technical services of mixed-fodder plants by the enterprises of Goskomsel'khoztekhnika [State Committee of the Agricultural Equipment Association]. The building of capacities for receiving grain during harvesting is proceeding slowly in inter-enterprise mixed-fodder plants, as is that of a drying enterprise and storage facilities for storing finished products. For these reasons each year a significant portion of the grain is used as forage without processing into mixed fodder and feed mixtures. There are also still existing problems between many mixed-fodder plants and cooperating enterprises.

In connection with this the board of the ministry passed a resolution calling the agricultural ministers of autonomous republics, the directors of production administrations of agriculture of kray and oblast executive committees to accelerate the course of fulfilling measures on the development of specialization and cooperation in feed production, to secure the complete and effective utilization of production capacities of the created mixed-fodder plants and other inter-farm enterprises on feed production and of specialized feed-production enterprises.

It has been suggested to the main administration of feeds, meadows and pastures, to the all-Russian production association Rosmezhkhozkombikorm [All-Russian inter-enterprise mixed-fodder association], to the main production administrations, to the Main Inspectorate on Inter-Enterprise Cooperation and Agro-Industrial Integration, to the main planning-economic administration together with local agricultural organs to secure an

improvements in the effectiveness of existing inter-farm enterprises for feed production, of feed-production enterprises and of inter-enterprise mixed-fodder plants, to improve the production-economic interrelations of inter-farm enterprises and cooperating enterprises to raise the mutual responsibilities and interests of enterprises to develop joint feed production and to achieve high production-economic indicators. It is essential to continue the work on imparting feed production with a more specialized nature in kolkhozes and sovkhozes as well as on an inter-enterprise basis by means of organizing inter-farm enterprises and specialized enterprises for the production and processing of feeds primarily on floodlands and reclaimed lands. Additional measures should be taken to increase the production of feed protein, to increase the sowing and harvesting of pulse crops and oil-bearing crops, soy, alfalfa, clover, and rape, to improve the technology of their cultivation and to achieve a significant increase in productivity; to achieve the full utilization of existing production capacities in inter-enterprise mixed-fodder plants, to expand their storage capacities and drying departments, and to secure the required amounts of protein-vitamin supplements according to the established plan of mixed-fodder production. Measures should be taken so that all grain going into livestock farming is fed in a processed and balanced form. The quality of processed mixed-fodder must be improved. The material-technical supplies for inter-enterprise mixed-fodder enterprises should be improved with provisions of new machines, technical and laboratory equipment, specialized transport, technical services and equipment repair services. Inter-farm mixed-fodder enterprises must be equipped with trained cadres. The plans for the distribution of capital investments must each year earmark resources for the creation of a material-technical base for feed production in kolkhozes, sovkhozes, inter-farm enterprises and specialized enterprises for the production and processing of feeds.

The All-Russian Scientific-Research Institute of Economics, Labor and Administration in Agriculture was made aware of the necessity to accelerate the development of recommendations on raising the effectiveness of inter-enterprise cooperation in the production and processing of feeds, in the organization of specialized feed-producing enterprises and in regulating production-economic interrelations between inter-farm mixed-fodder enterprises and kolkhozes and sovkhozes that participate in cooperation.

Deputy ministers V. N. Pustozarov and N. A. Pospelov have been assigned the task of controlling the fulfillment of the current resolution.

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LIVESTOCK FEED PROCUREMENT

FEED BASE FOR DAIRY COMPLEXES IN LOWER VOLGA ZONE

Saratov STEPNYYE PROSTORY in Russian No 12, Dec 79 pp 24-25

[Article by R.S. Frolova, Candidate of Economic Sciences at VNIIOZ: "Feed Base of Dairy Complexes"]

[Text] During the past few years, substantial changes have taken place in the development of public livestock husbandry. The productivity of the animals has been raised and milk production increased. There are presently more than 200,000 cows in the lower Volga zone and milk production is 400,000 tons, compared to 382,000 tons in 1975. The productivity of the cows has been raised by 25.6 percent, including at sovkhoses in Volgogradskaya Oblast -- by 22.1 percent, Astrakhanskaya Oblast -- by 19.4 percent and in the Kalmyk ASSR -- by 23 percent. Improvements were achieved in branch concentration. A considerable portion of the milk is being produced at dairy farms and complexes which have an industrial technology for livestock maintenance. However, dairy cattle husbandry on the whole continues to be carried out on a low level of management. The normative period for reimbursement of capital investments (8-10 years) for the construction and modernization of livestock farms is ensured by a livestock productivity of no less than 3,000-3,500 kilograms. The actual average milk yield for the region was just slightly more than 2,000 kilograms. At complexes in Volgogradskaya Oblast, the productivity of the cows is 2,665 kilograms; this corresponds to a 12 year period for reimbursement of capital investments. Labor expenditures and the production cost for milk remain high. All of this is mainly the result of an unsatisfactory feed base situation.

Arable land and natural lands constitute the principal source for obtaining feed on farms throughout the region. On the average for the 1975-1978 period, arable land accounted for approximately 60 percent of the feed and natural feed lands -- more than 30 percent. The proportion of feed obtained from irrigated lands was negligible (6-25 percent), despite the fact that this hydrological zone is subjected to extremely unfavorable weather conditions. The annual deficit in soil moisture ranges from 3000 to 5000 mm meters per hectare. The low level of intensity in feed production

adversely affects the productivity of the feed lands. It is sufficient to state that the feed yield per hectare in the Kalmyk ASSR was 1.92 quintals of feed units and from 1 hectare of sown areas -- 8.35 quintals of feed units. The figures for Astrakhanskaya Oblast were 2.7 and 12.6 quintals of feed units respectively. The irrigated lands were the most productive. In Volgogradskaya Oblast, for example, the productivity per hectare of such land was 43.4 quintals of feed units, thus exceeding by almost 15 times the productivity of natural haying and pasture lands.

The principal crops under irrigation are perennial grasses and corn. Their production is distinguished by a high level of economic efficiency. A fine example is the Volgo-Don Production Association in Volgogradskaya Oblast, where 100-110 quintals of hay, 400-500 quintals of fodder and more than 400 quintals of silage bulk are being obtained from each hectare.

Each irrigated hectare here furnishes from 192 to 308 rubles of net income and the production cost per quintal of feed units from hay is 1.6 times lower than the figure for the zone and in the case of fodder -- 1.44 times lower. Nevertheless, the irrigated land represents only a small proportion of the land used for feed production. Only 10 percent of the overall area used for feed crops is under irrigation. This is differentiated in the following manner: Volgogradskaya Oblast -- 12.2 percent, Astrakhanskaya Oblast -- 14.9 percent and the Kalmyk ASSR -- 3.8 percent, with 25.1, 14.3 and 6.3 percent of the feed being obtained from these regions respectively.

The actual type of feed employed during the winter period -- concentrate-silage with a strong straw supplement. During some years, it constitutes 12-15 percent of the ration and is imported from other rayons and oblasts. The proportion of purchased coarse and concentrated feed is particularly high (45-50 percent) in Astrakhanskaya Oblast and the Kalmyk ASSR.

Natural haying lands provide the basis for the internal supplies of coarse feed in addition to the secondary products of crop husbandry. In Volgogradskaya Oblast, such land accounts for 29.7 percent of the hay produced, in Astrakhanskaya Oblast -- 71.0 percent and in the Kalmyk ASSR -- 38.2 percent. During the summer, the principal feed is grass obtained from natural pastures and sown crops. As mentioned above, the natural feed lands are characterized by low productivity (2-3 quintals of feed units) and their duration of use is negligible; the pastures are completely burned up by the middle of July.

In addition to a low nutritional value for the feed, these factors also tend to restrain the development of dairy cattle husbandry and make it dependent upon the annual climatic conditions. Under such conditions, only irrigation can provide the foundation for creating a strong feed base. The organization of the feed base on the basis of irrigation will make it possible to increase sharply the production of livestock husbandry products and to utilize each hectare of land in an efficient manner. Let us glance

TABLE 1

Effectiveness of Feed Production at Sovkhozes in the Lower
Volga Zone (1975-1978)

Indices	Volgograd- skaya Obl.	Astrakhan- skaya Obl.	Kalmyk ASSR	Volga-Don Production Association
Production of milk products per:				
quintal of feed units, in rubles	14.11	9.54	10.97	20.23
hectare of feed area, in quintals	7.10	2.82	2.40	24.80
ruble of feed cost, in rubles	2.34	1.16	1.48	2.77
Profit (losses) per:				
hectare of feed area, in rubles	-9.10	-41.05	-31.53	199.45
quintal of feed units, in rubles	-0.72	-5.78	-5.10	5.82
Feed area required for the production of 1 quintal of milk, in hectares	0.140	0.350	0.211	0.041

once again at the Volgo-Don Production Association. The farm has 2,914 hectares of irrigated land, 80 percent of which is used for feed crops. More than 63 percent of the feed is produced on this land annually. In the absence of irrigation, only grain for concentrates and partially corn for silage are grown here. The feed lands are characterized by high productivity. The yield from 1 hectare amounts to 30.2 quintals of feed units, including 34.5 quintals of feed units from 1 hectare of sown crops, with 65.9 quintals of feed units being obtained from irrigated lands. This data exceeds corresponding data for the oblast by 2-4 times. The achieved level of intensity in feed production is making it possible not only to ensure that the livestock is fully supplied with internally produced feed, but also to bring about high payments for the feed (see Table 1).

The indices for cow productivity have been raised on the farm, the production cost for milk has been lowered and the profitability of dairy cattle husbandry raised. For example, the productivity of cows at the Volgo-Don Dairy Complex was 3,990 kilograms, the production cost per quintal of milk -- 17.95 rubles and profitability -- 58.1 percent. For each hectare of feed land, almost 25 quintals of milk are being produced and 200 rubles of profit obtained. For the region as a whole, feed production is unprofitable. In order to obtain 1 quintal of milk, 0.041 hectares of feed land are required, in Volgogradskaya Oblast -- 0.14, Astrakhanskaya Oblast -- 0.35 and in the Kalmyk ASSR -- 0.21 hectares.

TABLE 2

Principal Technical-Economic Indices of Variants for Organizing the Feed
Base for a Dairy Complex for 1200 Head

	Type of Feeding -- Concentrate-Silage-Haylage	Type of Feeding -- Concentrate-Haylage-Silage				
	Variants for Planning Solutions					
	1	2	3	1	2	3
Feed yield per hectare of feed area, in quintals of feed units	37.5	28.6	70.1	37.7	32.5	71.2
Feed area of complex, in hectares including irrigated area	1368	1794	732	1350	1563	714
Proportion of irrigated area, in %	459	339	732	441	381	714
Annual expenses for feed production (per hectare), in rubles	33.6	18.9	100.0	32.7	24.4	100.0
Labor expenditures per hectare of feed area, in man-hours	176	140	347	172	153	348
Production cost per quintal of feed unit for annual ration, in rubles	27.5	22.4	54.7	28.1	25.2	56.9
Labor expenditures per quintal of feed unit, in man-hours	4.69	4.89	4.96	4.55	4.70	4.89
Output production (milk) per hectare of feed area, in quintals	0.73	0.77	0.78	0.74	0.77	0.80
Feed area for production of 1,000 quintals of milk, in hectares	30.7	23.4	57.4	31.1	26.9	58.8
	32.6	42.7	17.4	32.1	37.2	17.0

A dairy complex is an enterprise of the industrial type engaged in the year-round production of products. As a result, priority importance is attached to ensuring a guaranteed and continuous supply of feed for the livestock. Studies carried out at VNIIOZ have made it possible to establish the fact that three variants are possible for organizing the feed base for farms in the lower Volga zone, depending upon the extent of livestock husbandry and the availability of irrigated lands:

1 -- only forage grain is grown without irrigation, the production of all other feed is based upon irrigation;

2 -- forage grain and corn for silage are grown without irrigation, with all of the remaining feed -- based upon irrigation;

3 -- all feed production based upon irrigation.

These three variants provided the foundation for planning the feed base for industrial complexes engaged in the production of milk. In analyzing the planning solution variants furnished in Table 2, it should be noted that in terms of the principal economic indices (production cost, labor expenditures per quintal of feed unit) the best variant was the first one, where only forage grain was grown in the absence of irrigation. However, from the standpoint of land usage, the third variant requires only 0.017 of a hectare for the production of a unit of output. Compared to the first two variants, this reduces the expenditure of arable land by 1.9-2.4 times and it results in the production of 57.4-58.6 quintals of milk per hectare of feed area, or 1.9-2.5 times more. Thus, all three of these variants, depending upon the specific conditions and the availability of irrigated land, can be used on farms when organizing a feed base.

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LIVESTOCK FEED PROCUREMENT

SUPPLY PROBLEMS IN TUL'SKAYA OBLAST FAULT OF RSFSR MINISTRY OF AGRICULTURE

Moscow TRUD in Russian 3 Feb 80 p 1

[Article by P. Uvarov (Leninskiy Rayon, Tul'skaya Oblast): "If Feed Preparation Shops Are in Operation"]

[Text] The following entry appeared in the livestock husbandry section on the index board at the Storozhevoye Sovkhoz: "85 kilograms of milk from each cow during the second half of January. This is 7 kilograms more than the amount planned."

The Storozhevoye Sovkhoz specializes in beef and dairy cattle husbandry. Its farms handle a milking herd of 1,150 cows. The production of livestock husbandry products is increasing here with each passing year. Compared to 1978 when an average of 3.150 kilograms of milk was obtained from each cow, last year 200 more kilograms were obtained. The farm is producing approximately 800 quintals of milk and more than 70 quintals of meat per 100 hectares of agricultural land. This is almost slightly more than two times higher than the average level for the oblast.

Last year's drought prevented the sovkhos from laying away a full supply of feed. Although the collective succeeded in cutting down, thrashing and stacking everything that was grown out on the fields, as well as storing silage and haylage in concrete trenches, nevertheless only 16.5 quintals of feed units per cow were available for the winter -- two thirds of the norm. Despite this fact, the livestock breeders, after weighing all of their possibilities, undertook the obligation of obtaining no less than 2,300 kilograms of milk from each cow during the winter period.

Strict control was established over all of the feed and forage personnel were assigned to the farms. Four feed preparation shops operate around-the-clock, the cultivation of fodder on a hydroponic basis was organized and a dry milk substitute is being prepared for calves.

However, there are a large number of problems which the farm is incapable of solving. For example, the required amounts of spare parts for

equipping the feed preparation shops are lacking. Several years ago, one of the Goskomsel'khoztekhnika associations organized the production of drum-type straw steaming plants in Tul'skaya Oblast. Initially, spare parts were available for these plants. However, this is not the second year that such equipment is not being produced. They have also ceased producing the spare parts -- it is maintained that such work is unprofitable.

At the present time, one has to travel almost throughout the entire oblast in order to find a particular part. The oblast's Goskomsel'khoztekhnika Association is not producing spare parts under the pretext that the locally produced feed steaming plants are clearly obsolete. It is difficult to understand how this could happen in just 2-3 years. Indeed, such steaming plants are to be found on all farms throughout the oblast. Should they now be rejected, even though the new F-12 units promised by Goskomsel'khoztekhnika have still not begun to arrive?

There is still another example. Mineral feed additives are being discussed extensively during oblast conferences. But only limited amounts are being received from the bases. The plan for 1979 called for the oblast to be supplied with 1,800 tons of monopotassium phosphate and yet it received only 1,100 tons. Of 1,500 tons of dynatriphosphate expected, not 1 gram was received.

Yes, the feed additives constitute a problem! There is a shortage of salt licks, not to mention finely ground salt. Yet it is needed for seasoning the feed.

Nor is the problem simply one of poor work on the part of the oblast's supply organizations. They supplied the farms with everything that was available. But these funds satisfy only one fifth of the livestock husbandry requirements. All of the salt was consumed during the summer and thus by winter, when it is required in particular for the animals, none was available. Such planning is mainly the fault of the RSFSR Ministry of Agriculture.

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IDEAL LIVESTOCK COMPLEXES FOR PENZENSKAYA OBLAST DESCRIBED

Saratov STEPNYYE PROSTORY in Russian No 8, Aug 79 p 7

[Article by I.I. Abrutin and N.V. Goryachev, candidates of economic sciences at Penza Agricultural Institute: "Which Complexes Are More Profitable?"]

[Text] The capital investments in livestock farms in Penzenskaya Oblast are increasing annually. Whereas in 1970 the total amount of such investments was 8.5 million rubles, by 1975 it had increased to 22.3 million rubles. In 1978, the overall value of equipment on the farms exceeded 70 million rubles.

An analysis carried out on 48 sovkhoses in Penzenskaya Oblast having developed dairy husbandry operations has shown that the principal economic indices of dairy husbandry tend to improve (see Table) as capital investments are further concentrated.

It is apparent from the data in the table that expenditures per quintal of milk at sovkhoses in the third group are 26-53 percent lower than those at sovkhoses in the first group. This index is most high at industrial dairy complexes of the Ternovskiy and imeni Makhalin sovkhoses. The capital labor ratio and capital output ratio are higher at such farms: thus a considerable increase in the capital labor ratio at a large marketable milk farm of the Bol'shevik Sovkhoz (over a period of 3 years, this index increased by almost twofold) promoted an increase in labor productivity in dairy cattle husbandry of 24 percent. This was promoted to a considerable degree by additional capital investments in mechanization equipment.

Overall, in the structure of operational expenses per quintal of milk, during the past few years at sovkhoses in Penzenskaya Oblast, an increase has taken place in the specific expenses associated with the use of fixed productive capital (current repairs, technical servicing, amortization), with a reduction of sorts taking place in wage expenditures. Thus, from 1975 until 1977, their proportion increased by 10.5 percent at the Trudovoy Put' Sovkhoz, by 28 percent at the Bol'shevik Sovkhoz and by 45 percent at the Prigorodniy Sovkhoz.

Dependence of Economic Indices of Milk Production Upon Concentration of
Specific Capital Investments at Sovkhozes

Nr. of farms in group	Specific capital investments in fixed productive capital, rubles		Average annual milk yield per cow, in kg	Output obtained per ruble of capital investments, in rubles	Labor expenses per quintal of milk, in man-hours
	Per hectare of agricul- tural land	Per worker			
I-13	Up to 400	6550	2300	0.47	9.2
II-26	401-800	8597	2403	0.62	8.1
III-9	More than 800	11825	3154	0.64	6.4

The growth in these expenditures was particularly noticeable at industrial dairy complexes. Whereas in 1977 the average expenditures at the Gorodischenskiy Sovkhoz for the repair and technical servicing of equipment at the MTF [dairy farm] amounted to 1.83 rubles (in 1970, 1.18 rubles), for a dairy complex the figure was 2.18 rubles per quintal of output, or 14 percent more. The operational expenses per quintal of milk at the complex were 12 percent lower than those for other production subunits and this tends to underscore the advantages of large dairy farms which operate on the basis of an industrial technology.

A study of the operation of dairy sovkhozes has shown that the effectiveness of capital investments is usually higher in those areas where the machines, equipment and other active capital constitute no less than 12-15 percent of the fixed productive capital. The capital output ratio is higher at these sovkhozes.

The effectiveness of specific capital investments (per quintal of milk) is adversely affected by the formation of a herd having a low potential productivity and also by a low proportion of capital investments allocated for strengthening the existing feed base and creating a new one. Thus the lack of complete solutions for those problems associated with the use of capital investments in dairy cattle husbandry is adversely affecting the economic indices of this branch.

In lowering specific capital investments, great importance is attached to obtaining an optimum solution for all problems associated with the installation of livestock facilities. According to data obtained from Penzsel'khozstroy Institute, projects for 2,000 head lower specific capital investments (for one animal billet) by 21 percent, compared to a project for 1,000 animal billets. In particular, a reduction takes place in specific expenditures for acquiring equipment and implements and the efficiency of their use is raised. According to preliminary studies, a

complex for 2,000 head promotes a reduction in direct operational expenses and for a productivity of no less than 3,000 kilograms annually it is possible to achieve a coefficient of use of capital investments of 0.12-0.13, which is sufficient for ensuring their normative reimbursement and high effectiveness.

Such farms usually have a supporting-beam structure, with 1,000 or more cows being accommodated under one roof. In such instances, the productivity is greatly affected by stress phenomena which arise during the issuing of feed and the carrying out of other technological operations. They adversely affect the productivity of the livestock and, beyond any doubt, lower production efficiency on the whole.

Moreover, according to studies carried out at the All-Union Scientific Research Institute for the Mechanization of Livestock Husbandry, the expected savings in capital investments through a reduction in the length of walls is actually not being achieved. To the contrary, more complicated floors are bringing about a considerable increase in costs. For example, the cost of 1 square meter in a facility measuring 144 X 90 centimeters is 24.66 rubles and in a pavilion structure 27 meters wide -- 20.56 rubles.

This factor, coupled with the impossibility of filling the complex with standardized animals on a one-time basis, raises doubts as to the advisability of constructing such facilities.

We are of the opinion that it would be best to build complexes consisting of facilities of the pavilion type for 400-600 cows. These could be used for forming a dairy complex for 2,000 head, or any other size herd that meets the requirements for an industrial technology. In each specific instance, it will be necessary to take into account not only a decrease in specific capital investments, but also a subsequent reduction in operational expenses, both per head of cattle and per quintal of output.

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LIVESTOCK

BREEDING WORK AT INDUSTRIAL LIVESTOCK COMPLEXES IN KUYBYSHEVSKAYA OBLAST

Saratov STEPNYYE PROSTORY in Russian No. 10, Sep 79 pp 40-41

[Article by M.P. Ukhtverov, Candidate of Agricultural Sciences at the Kuybyshev Agricultural Institute: "Breeding Work at Industrial Complexes"]

[Text] At the present time, local systems for the breeding of pigs have been developed in many oblasts throughout the Russian Federation (including Kuybyshevskaya Oblast). These systems call for the creation of genetically unconnected breeding farms, required for ensuring the unrelated breeding of animals during mating, not only of different strains but of the same strain at breeding facilities of commodity farms.

As a result of extended selection work carried out in our oblast, two unrelated group genotypes for animals of the large white strain have been created. The first breeding complex was formed based upon the use of pigs from the Krasnyy Stroitel' Breeding Plant and its subsidiary farms: the Kamyenny Brod Breeding Sovkhoz, breeding farms of the Alekseyevka Pig Complex and breeding farms of the Kanash Breeding Plant. The genealogical structure of the herd at the Krasnyy Stroitel' Breeding Plant consists mainly of animals of local selection and pigs of English and Swedish origin. The breeding of animals in this herd is carried out only on the basis of intralinear selection.

Some of the productivity indices for animals in this herd are as follows. The polycarpic effect for all of the sows fluctuates on the order of 11-12 suckling pigs. On the basis of data accumulated over a period of many years at the oblast station for controlled fattening, the offspring of boars and sows reach a live weight of 100 kilograms in 190-200 days, 3.8-4.0 feed units are expended per kilogram of weight increase, the lard has a thickness of 2.7-3.0 centimeters and the weight of the ham is 10.5-10.8 kilograms. These animals do not have a great range of variability in their productive indices.

The second breeding complex was initially established using pigs obtained from breeding farms in Altayskiy Kray. But despite the polycarpic effect and fine fattening indices, they were considerably more fat than the

animals obtained from the Krasnyy Stroitel' Breeding Plant. Thus the use of these pigs in the accepted breeding system did not ensure the development of marketable forms of hybrids having a high meat content on a carcass. Moreover, we were forced into replacing the Altayskiy pigs with animals obtained from Estonia which were considered to be more productive from the standpoint of meat. These latter animals were being used at a breeding farm of the Kuybyshev NIISKh [Scientific Research Institute of Agriculture].

The pedigree pigs of the large white strain, imported into our oblast from Estonia, differ in terms of their lighter trunk forms. Under optimum feeding and maintenance conditions, they are capable of displaying a rather high degree of productivity. In terms of the level of development of their economically useful characteristics and their variability, they differ very little from the herd of pigs at the Krasnyy Stroitel' GPZ [state breeding plant]. The boars and sows are joined together mainly along four plant lines, each of which is bred along a minimum of two branches. The existing number of lines makes it possible to breed a herd of a closed type of population, in the absence of related mating and the use of other group genotypes over an extended period of time. Estonian type pigs of the large white strain are also bred at a training farm of the Kuybyshev SKhI [Agricultural Institute] and at breeding farms of kolkhozes in Pokhvistnevskiy Rayon.

At a reproduction farm of the Komsomolets Sovkhoz, we carried out a check on the effectiveness of mating animals from various plant types in the large white strain. The following plan was employed for carrying out the experiment (see Table 1).

TABLE 1

Groups	Place of Procurement or Raising		Number	
	Sows	Boars	Sows	Boars
1	Krasnyy Stroitel' GPZ	Krasnyy Stroitel' GPZ	15	7
2	p/f [breeding farm] of KNIISKh [Kuybyshev Scientific Research Institute of Agriculture]	p/f KNIISKh	14	5
3	Krasnyy Stroitel' GPZ	p/f KNIISKh	16	10
4	p/f KNIISKh	Krasnyy Stroitel' GPZ	26	9
5	Komsomolets Sovkhoz	Krasnyy Stroitel' GPZ	15	7

The task of the studies included:

...analyzing the productivity of the pedigree pigs at the complexes, using boars and sows from the same breeding farm (1st and 2d groups);

...comparing the productivity of the pigs at commodity farms, using for mating purposes boars obtained from one breeding farm and young pigs obtained from another (3d and 4th groups);

...studying the productivity of young pigs raised at the Komsomolets Sovkhoz, with the mating being carried out using boars obtained from breeding farms (5th group).

During the experiment, consideration was given to the polycarpic effect on the sows, to the size of the offspring and to the weight of the nest at 1 and 2 months of age. The data obtained, from various combinations of plant types, underscores the fact that imported pedigree sows, when mated with boars from these same farms at the Komsomolets Sovkhoz, produced a good number of offspring (11.0-11.1) following the first farrowing. At the breeder farms themselves, this index was 11.2

The productive qualities of the pigs, assuming their reciprocal use (sows from one breeding farm and boars from another), were characterized by very high indices. They surpassed animals in the remaining groups in terms of number of offspring by 0.3-0.4 suckling pigs and in weight of the nest at 1 month of age -- by 3-9 kilograms and at 2 months of age -- by 9-19 kilograms.

The meat and fattening qualities of the offspring were checked during controlled fattening. For this purpose, 20 weaned animals (50 percent young pigs and 50 percent hogs) were selected from the 1st, 3d and 4th groups. These animals, which had an average live weight typical of each group, were assigned in groups of four to controlled pigsties. The fattening was carried out to a weight of 100 kilograms. The data is furnished in Table 2.

TABLE 2

Fattening and Meat Qualities of Gilts Obtained From Various Combinations of Plant Types

Groups	Age at which weight of 100 kg achieved, nr. of days	Feed consumption per kg of increase in weight, in feed units	Length of carcass, in cm	Thickness of lard, in cm	Weight of ham, in kg
1	201 ± 2.8	4.12 ± 0.06	97.6 ± 0.4	2.97 ± 0.10	10.6 ± 0.12
3	190 ± 2.1	4.05 ± 0.09	97.8 ± 1.2	2.94 ± 0.07	10.5 ± 0.10
4	197 ± 2.2	3.94 ± 0.07	97.6 ± 0.8	2.89 ± 0.10	10.4 ± 0.13

Almost no differences were observed between the experimental groups in terms of the indices for meat qualities. This is quite understandable -- both types were characterized by rather high and similar indices for development. Thus there is no basis for expecting a special combination

capability effect, owing to the fact that the indices of meat content are of an intermediate inheritance nature.

Based upon the accepted system for breeding pigs, the use of two plant types in reciprocal mating is directed towards obtaining high grade pedigree young stock (young pigs) at a breeding farm, for transfer to a productive herd.

For the purpose of studying this problem, four suckling sows having 10-11 young pigs in their nests were taken from each group for control purposes. The litters were practically the same in terms of the number of young pigs and young boars. In terms of farrowing time, the sows differed from one another by 8-10 days. The feeding and maintenance conditions were similar. During the control process, the following indices were taken into account: protection of young pigs, number of young pigs selected for replacement purposes at four and a half months of age and having a live weight no lower than the requirements for 1st class and number of animals transferred over for fattening.

The results of the analysis are furnished in Table 3.

TABLE 3

Movement of Offspring Obtained From Different Breeding Variants

Groups	Suckling Pigs Obtained		Distribution of Offspring at 4.5 months of age (in % of number of head obtained)		
	Total	Including young pigs	Replacement young pigs selected	Transferred for fattening	Sold to population
1	42	22	28.6	40.4	31.0
3	42	22	33.4	38.0	28.6
4	42	20	33.4	40.4	26.2

Thus the materials obtained from this study testify to the fact that young replacement pigs for a productive herd are best obtained through intercrossings of pigs of the red-form and Estonian types. The mating variant adopted makes it possible to obtain replacement young pigs which attain a live weight of 100 kilograms in 210-215 days and have a lard thickness on the order of 2.7-3.1 centimeters. In addition, a higher degree of vitality and preservation is expressed in offspring obtained by means of the mentioned breeding variant, than is the case when these types are bred separately, a very important factor when they are employed at industrial complexes.

At the present time, the production of young replacement pigs at reproduction farms, using two unrelated plant types, has been introduced or is being introduced at many sovkhozes of the Svinoprom Trust in Kuybyshevskaya Oblast.

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LIVESTOCK

CONFERENCE EXAMINES GOALS OF VOLGA LIVESTOCK FARMING

Saratov STEPNIYYE PROSTORY in Russian No 12, Dec 79 pp 2-6

[Article: "Responsible Examination of Livestock Farmers"]

[Text] The party and state exhibit unceasing concern for improving the well-being of the people. Agricultural workers have as their goal the task of securing the continued dynamic growth of livestock farming and the increase in the production of meat, milk and other animal products. Its essence is to not only fulfill the plan of the current year but also to create all of the prerequisites for increasing the production of these products in the final year of the 10th and in the subsequent years of the 11th five-year plans. This was the topic under discussion at the recent meeting-seminar of responsible workers of ministries of agricultural of the autonomous republics, of agricultural administrations of oblast executive committees, of state breeding associations, of the trusts Skotoprom [Livestock Raising Trust], Svinoprom [Hog Raising Trust], Ovtseprom [Sheep Raising Trust], Plodoprom [Fruit Raising Trust] and Ovoshcheprom [Vegetable Raising Trust].

Participating in the work of the conference was the deputy minister of agriculture of the RSFSR, G. S. Ogryzkin. The keynote speaker was the director of the Main Production Association of Povolzhskiy Rayon, A. P. Chernyayev, who discussed, "The Status of the Development of Livestock Farming and the Tasks for the Successful Overwintering of Livestock."

The decisions of the July 1978 Plenum of the CPSU Central Committee planned for increasing meat production by 19.5 million tons by the end of the five-year plan in the country. This is possible only through the continued increase in the number of animals and through an increase in the productivity of animals.

The General Secretary of the CPSU Central Committee, Comrade L. I. Brezhnev, placed special emphasis on not tolerating a decrease in the animal herd and on securing the preservation of livestock and fowl.

In Povolzh'ye the current overwintering of livestock is occurring under difficult circumstances. But oblasts and republics are conducting certain operations to increase production and the procurement of animal products. In the region as a whole the cattle herd and the number of fowl have increased. It is planned to deliver 6 percent more meat to the state than last year. Egg procurement will increase by 50 million eggs.

The best indicators were achieved by the kolkhozes and sovkhoses of Ul'yanovskaya Oblast. They increased the delivery of livestock and fowl to the state by 10 percent and of milk--by 3 percent.

Having weighed their possibilities, Kuybyshev farmers became the initiators of socialist competition for the successful completion of overwintering of cattle and for increasing the production and procurement of meat, milk and other animal products. They are stubbornly moving toward the indicated goal. Kuybyshev livestock farmers have prepared well for the stall period. They have pledged to surpass all of the indicators of last year's overwintering and to fulfill the national economic plan for 4 years of the five-year plan ahead of schedule. The board of the RSFSR Ministry of Agriculture and the presidium of the republic's trade union committee of agricultural workers of the RSFSR approved this valuable initiative. During the winter period 1,650-1,700 kilograms of milk are to be produced and milk yield per cow is to increase by 30-50 kilograms. The organization of raising and fattening animals is to improve, with delivery weights of cattle increasing to 380-400 kilograms and that of hogs to 110-120 kilograms. It will be necessary to secure the growth of the number of livestock and fowl and to preserve them at a high level.

What is the basis for the self-assurance of Kuybyshev farmers? Most kolkhozes, sovkhoses and inter-enterprise associations in the oblast prepared their farms for overwintering well ahead of schedule. They completed the building and repair of livestock facilities and feed shops and they adjusted technological equipment. Despite the unfavorable weather conditions many enterprises increased the procurement of hay, haylage, silage and have improved their quality.

The livestock of the kolkhozes and sovkhoses of Bashkirskaya ASSR and Ul'yanovskaya Oblast have prepared livestock for overwintering better than last year.

The material-technical base of livestock farming is being methodically strengthened in Saratovskaya Oblast. This year new facilities for overwintering have been introduced with a capacity for 21,000 head of cattle, 32,000 hogs and 27,000 sheep; 77 feed shops and feed-mix lines have been built; and haylage towers and faced trenches for 400,000 tons have been built. Many kolkhozes and sovkhoses prepared their farms ahead of schedule for operating during the winter and they transferred livestock to stall upkeep in an organized manner.

The livestock farmers of Tatariya have complex and serious tasks before them. They have taken on the responsibility of producing 590,000 tons of

milk, 150,000 tons of meat and 260 million eggs and to produce 1,450 kilograms of milk per cow, which is 140 kilograms more than last year. They plan to sell the state no less than 90 percent first-quality products.

As shown in statistical data, all livestock facilities in the republic were ready for stall upkeep by 1 October. Farms are equipped with brigade leaders, livestock workers, milkmaids, calf-herds and technologists for artificial insemination.

Nevertheless even the greatest pledges mean nothing if they are **not** followed by deeds. It is essential to recognize that the work being done in oblasts and autonomous republics in Povolzh'ye to increase the production and procurement of livestock products is inadequate. Not all directors of kolkhozes and sovkhoses were able to eliminate the difficulties resulting from a dry spring and summer, to supply enough feed for livestock and to skilfully organize its effective utilization.

The continued rapid improvement in livestock farming can occur only if the feed base is developed and guaranteed and if farms are supplied with the necessary amounts and quality of **full-value** feed.

The procurement of feed in Saratovskaya Oblast is not organized badly. In order to develop the necessary reserves 656 enterprises created 654 feed-production brigades with 1,298,000 hectares of land, including 255,000 irrigated hectares, and 10,800 tractors. There are 28,000 people working in the branch of feed production. Most of the straw from last year and the current year has been moved to the places of overwintering. In the oblast 2.8 million tons of straw have been procured, 4 million tons of silage, 432,000 tons of hay, 442,000 tons of haylage, over 103,000 tons of mixed silage and 124,000 tons of root crops. In the oblast as a whole significantly more coarse feeds have been procured than last year.

Here not only individual enterprises but entire rayons are changing to a modern method of feed production. Novouzenskiy Rayon is an example. It is located in the dry zone of Povolzh'ye. In 1977 all the enterprises made feed production an independent branch, reexamined crop structure, introduced crop rotations, created specialized subdivisions and this year achieved a sharp increase in feed production and in feed quality. The rayon's enterprises procured 100 percent of the needed coarse feed, 152 percent of the hay, 70 percent of the haylage and 90 percent of the succulent feed. Each hectare produced 18 quintals of feed units of hay and haylage.

In many kolkhozes and sovkhoses of Povolzh'ye feed production is becoming a leading branch. It would seem that rich experience has been amassed. Nevertheless there are cases in which the directors of kolkhozes, sovkhoses and agricultural organs have not drawn the proper conclusions from the sad lessons of past years.

The year 1978 was one of the most favorable not only for the growth of grain crops but also for feed crops. This enabled farmers to store enough coarse and succulent feed. There were calls to store a 2-year supply. Zealous directors did this. And naturally they had feed during last year's severe winter and they have stored enough for this winter. Meanwhile, many enterprises in the zone have not harvested the straw from their fields. In some kolkhozes and sovkhoses corn is still standing in the fields and the aftergrass of perennial grasses and natural pastures as well as the haulm of sugar beets are not being utilized.

The negligent as usual hope for aid from above or from their zealous neighbors. Such practices are reprehensible and worthy of the strictest punishment.

Even with the shortage of feed in many rayons and enterprises in the zone for this year's winter, there remains a careless attitude toward the feed. For example, a number of kolkhozes and sovkhoses of Krasnopartizanskiy, Yershovskiy, Aleksandrovo-Gayskiy, Baltayskiy, Dukhovitskiy, Saratovskiy and Lysogorskiy rayons of Saratovskaya Oblast which began the overwintering period with a shortage of feed supplies do not take the necessary measures to utilize them efficiently. In Arkadakskiy, Balashovskiy, Vol'skiy, Bergachevskiy, Khvalynskiy, Trishchevskiy and some other rayons a significant number of feed shops began operating very far behind schedule or did not begin operating at all. As a result in the oblast almost half of the coarse and concentrated feeds are fed in an unprepared form. The enrichment of concentrates with yeast is not given the necessary significance.

Some directors and specialists of the zone's kolkhozes and sovkhoses do not keep accounts and do not have the proper attitude toward the preservation of feed reserves. They did not establish limits for their consumption and they tolerate their deterioration. There are also great losses during distribution.

Last year the kolkhozes and sovkhoses of Ul'yanovskaya Oblast did not fulfill their plan for procurement even in a single feed. The same thing happened this year. The shortage of coarse and succulent feeds comprised from 20 to 30 percent, of haylage and grass meal--almost 70 percent. The reason for this was the low productivity of feed crops.

Feed supplies are extremely low in Astrakhanskaya Oblast: coarse--91 percent, succulent--41, and concentrated--7.4 percent undersupply.

There must be a radical change in the attitude toward feed production. The time has come to make it an independent branch everywhere. The directors have the proper attitude if they create special enterprises, inter-farm enterprises for feed production, if they specialize departments and brigades in this work and allocate land and equipment to them.

In the zone there are over 1,160,000 hectares of irrigated lands. This is our golden treasure and it must be utilized with the greatest return.

Nevertheless many enterprises produce extremely low yields of feed crops on irrigated land. For example, in Bashkirskaya ASSR in 1978 the corn yield was only 204 quintals per hectare as compared with the planned 286; in Volgogradskaya Oblast--206 as compared to 267; and in Saratovskaya--187 as compared with 282 quintals per hectare.

It should be noted that much has been said previously about the shortcomings that exist in the use of irrigated lands. The time has come to take decisive measures to eliminate them. The way to do this is to persistently introduce the valuable experience of leaders into practice. In the same Bashkirskaya ASSR in the Kolkhoz imeni Salavat Yulayev in Sterlitamakskiy Rayon 75-80 quintals per hectare of hay are produced on each irrigated hectare each year. The result of this is that the milk yield in this enterprise exceeds 3,700 kilograms from each cow.

The progressive technology for feed procurement is not being introduced broadly enough in the region. This year only 516,700 tons of grass meal, or 81 percent of the plan, were procured. In Ul'yanovskaya Oblast the output per unit was 134 tons, in Tatarskaya ASSR--165 tons.

Very little silage with carbamide has been stored--1,628,000 tons. In Bashkirskaya ASSR 72,000 tons were stored; in Tatarskaya ASSR--12,000 tons.

Special attention must be given to the quality of the feed. In Kalmytskaya ASSR over 38 percent of the hay cannot be classified. In Kuybyshevskaya Oblast one-fifth of the grass meal was substandard. In Ul'yanovskaya Oblast 65 percent of the procured haylage was substandard. The reason for this is a violation in the technology of procurement.

Efficient methods of preparing feeds for feeding are important. In the zone's enterprises the proportion of straw in the balance of coarse feeds is 50 percent. Positive results cannot be achieved without preparations for feeding using thermochemical methods. Energetic measures are needed to complete the building of new and the renovation of existing feed shops. It is essential to equip them with experienced cadres. We must make sure that all feed that requires processing is fed to animals after it is processed.

At the present time, when the livestock has been moved to winter upkeep, it is necessary to organize precise operations on farms, to bring coarse feeds to the location of winter upkeep, to temporarily and permanently store them by delivering them to responsible individuals, to set up a daily ration schedule and monthly consumption plans. All feed-production technology must be put into operation.

The shortage of feeds and feeding them in an unprepared form, poor preparations of livestock farms and mechanisms for overwintering, an insufficiently precise organization of labor for livestock farmers results in a loss of productivity, in mass epidemics of animals and in cattle plague.

This results in a decrease in the herd and a drop in animal production output. It must be admitted that in this regard things are not well in the enterprises in Povolzhskiy Rayon. This year there has been a noticeable drop in the pace of animal production output as compared with last year.

During 9 months of the current year there was an underproduction of 25,000 tons of beef and poultry. The plan was fulfilled by 90 percent. The Tatar ASSR fulfilled its plan by only 81 percent, and Volgogradskaya Oblast--by 86 percent. The enterprises of Bashkirskaya ASSR are proceeding with the procurement of livestock and fowl at a slow pace. Because of unsatisfactory work in a number of oblasts the plan for meat procurement is in danger of not being fulfilled. But the state plan is law and it must be fulfilled rigorously.

It is essential to take measures that will enable us to secure the consistent growth of animal production output in each kolkhoz and sovkhos and in each inter-enterprise association and enterprise.

In addition to strengthening the feed base we must strengthen the organizational work on farms and to establish the strictest controls over the technological conveyor for raising and fattening livestock and for delivering it to meat combines. Livestock farmers must more fully utilize intensive factors, to perform all operations involving the raising of calves on a scientific basis so that the delivered calves weigh no less than 400 kilograms and are in high nutritive condition when they are delivered.

It is very important to reach a level of organization for herd reproduction that will enable us to sharply increase the replenishment of farms with calves. However, this question is not given the necessary attention everywhere. The increase in the cattle herd in the zone comprised only 109,600 head, or 1.3 percent. The birth rate for cattle is intolerably low. On the average for the zone each 100 cows produce 69 calves, which is 1 calf less than last year. In Tatarskaya ASSR 63 calves are produced per 100 cows, or 5 less than last year. In Saratovskaya Oblast the addition of calves is extremely low. Whereas last year 70 were produced per 100 cows, this year the figure dropped to 61.

In most enterprises of the zone there are great losses due to cattle plague. This year about 340,000 head, or almost 40,000 more than last year, died of cattle plague.

An important resource for increasing meat production is the intensive fattening of livestock and the increase in weight gain of animals. In leading enterprises and specialized inter-enterprise enterprises the daily weight gain in cattle being fattened exceeds 1,000 grams. In the Kolkhoz Imeni Salavat Yulayev of Bashkirskaya ASSR last year the average daily weight gain of cattle comprised 1,024 grams; this year--1,025 grams. At the Khimichnyy Complex of Kuybyshevskaya Oblast 10,000 head produced a daily weight gain of 900 grams. In the inter-enterprise feedlot of the Yulduz

Sovkhoz of Tatarskaya ASSR in 9 months of the current year 2,400 head of cattle were delivered with an average weight of 408 kilograms. The average daily weight gain was 880 grams.

As we can see, in this regard much rich experience has been accumulated. Nevertheless, in many enterprises the weight gain for cattle being fattened did not exceed 350-380 grams. In Volgogradskaya Oblast during the first half of the current year the average daily weight gain for cattle was 338 grams; in Kalmytskaya ASSR--386 grams.

There continue to be cases in which low-weight cattle is delivered. This applies in particular to Astrakhanskaya Oblast. The average weight of cattle sold here does not exceed 280 kilograms. More than half of the sheep delivered to the state are of average to low and low weights. The same picture can be found in Volgogradskaya Oblast.

The region has all the necessary conditions for the development of meat livestock farming. Nevertheless as of 1 October the kolkhozes and sovkhoses of Povolzh'ye had only 172,800 cows, or 32,400 less than in 1978. The enterprises of Saratovskaya and Ul'yankovskaya oblasts and Kalmytskaya ASSR have decreased their numbers of meat cows.

An important role in forming a meat balance in the country is played by hog farming. In most oblasts and autonomous republics a great deal of work has been done in recent years to renovate farms and increase the number of hogs, to specialize and concentrate hog production and to place it on an industrial base. But this is not the case everywhere by far. The enterprises of Volgogradskaya and Ul'yankovskaya oblasts and Bashkirskaya and Kalmytskaya ASSR's decreased their numbers of hogs. There were fewer births of piglets than expected, particularly in Volgogradskaya and Saratovskaya oblasts and Tatarskaya ASSR.

In Volgogradskaya Oblast the pace is slow for the assimilation of production capacities in hog-raising complexes, large specialized farms and inter-farm enterprises. This holds back their achievement of planned indicators.

The directors of ministries in the autonomous republics and of production associations of agriculture in oblast executive committees must carefully examine the status of hog farming in each kolkhoz, sovkhos and inter-farm enterprise, find unused resources and use them.

The intensive raising and fattening of hogs should be organized, with average daily weight gains of 370-400 grams. On large mechanized farms and in complexes this should be increased to 600 grams. Each hog should weigh no less than 110 kilograms when delivered to the state. It is very important not to decrease the herd and especially the number of child-bearing females.

The Povolzh'ye produces a large proportion of products from sheep farming. As of 1 October enterprises delivered over 70,000 tons of high-quality wool to the state, or 27 percent of the procurement of the RSFSR. Saratovskaya Oblast and Kalmytskaya ASSR are dealing successfully with fulfilling the plan for the growth of the sheep herd and of wool procurement.

Nevertheless in the zone there are oblast and republics where the necessary attention is not given to the development of sheep farming, where the necessary measures are not taken to increase the herd and the productivity of animals. In Ul'yankovskaya Oblast a decrease in the herd was tolerated. The yield of lambs per 100 ewes is very low. In the oblast as a whole the figure does not exceed 50-63 lambs, and in some enterprises almost half this number are produced. In the Sovetskaya Rossiya Kolkhoz of Staromayskiy Rayon 29 lambs were produced; in the Vernyy Put' Kolkhoz of Karsunskiy Rayon--30.

More attention should be given to the development of sheep farming. There must be more building of inexpensive feedlots, which have been shown to be effective in practice. During the winter period it is very important to create the best conditions for birthing and for a complete lamb survival rate as well as for increasing weight gain.

It is essential to import more highly-productive sheep from the southern oblasts of our zone in order to improve the breed composition and increase the yield of wool in Ul'yankovskaya and Penzenskaya oblasts and Tatarskaya and Bashkirskaya ASSR's.

Livestock farmers have the task of fully satisfying the needs of the population for milk and dairy products in the required assortment in the near future.

In comparison with last year the enterprises of Astrakhanskaya, Saratovskaya and Ul'yankovskaya oblasts increased the productivity of cows and the procurement of milk in kolkhozes and sovkhozes. Nevertheless, in the zone as a whole the milk yield per cow is still low and is 50 kilograms less than the average for the RSFSR.

The enterprises of Tatarskaya ASSR have decreased milk yield by almost 100-150 kilograms per cow as compared to last year's levels. The republic fulfilled its 6-month plan by only 85 percent. There is an obvious threat that the annual plan for milk procurement will not be fulfilled.

In Povolzh'ye in recent years a great deal of work has been done to use industrial technology in milk production. The best indicators were achieved by the complexes of Penzenskaya and Kuybyshevskaya oblasts, where the milk yield per cow was over 3,000 kilograms.

In the dairy complexes of Saratovskaya, Astrakhanskaya and Volgogradskaya oblasts the work level in dairy complexes is extremely low. The organization-

al and technical measures that have been developed here to improve the operations of complexes are not being fulfilled.

The most energetic measures must be taken to eliminate shortcomings in the work of complexes and in particular to supply them with highly-productive herds that are adapted to industrial technology. Special attention must be given to securing a clear organization of operations during the stall period.

The livestock farmers of Povolzh'ye have the task of increasing milk yield per cow to 3,000 kilograms in the near future. To meet this goal it is necessary to raise the productivity of the herd. Insemination must occur on schedule and barrenness must be eliminated. At the present time on the average in the zone the proportion of cows within the herd structure is 32 percent, but it is essential to increase it to 50-55 percent in special enterprises and to 85 percent in inter-farm enterprises. The most careful attention must be given to raising replacement heifers in specialized enterprises as well as on the farms of large dairy enterprises. They should be properly fed and inseminated on schedule. No less than 25 percent of the herd should consist of new heifers. This will enable farmers to remove low-productivity and old cows from the herd on schedule, thereby securing the growth of the dairy herd.

Unfortunately it must be said that the enterprises in the zone under-produce offspring by 6-7 percent. This is not the result of poor feeding, but of poor organizational-zootechnical operations. An important role in eliminating this problem will be played by the introduction of the flow-shop system in large dairy complexes and on farms. At the present time over 400 enterprises are changing to this system in the zone. This direction is being energetically taken by Kuybyshevskaya and Saratovskaya oblasts, which cannot be said for Volgogradskaya, Ul'yanovskaya oblasts and Bashkirskaya ASSR.

The veterinary service will play an especially-important role in successfully overwintering the livestock, in raising its productivity and in improving the reproduction of the herd. Veterinary specialists are obliged to perform careful clinical observations of the entire herd, to organize the necessary treatment of the sick and weak animals, to fulfill the complex of prophylactic veterinary-sanitary measures to protect animals from diseases and cattle plague. A subject of special concern in the fight against infertile animals, the organization and performance of artificial insemination and the mating of animals.

The veterinary-bacteriological and agrochemical laboratories must perform extensive work on studying the quality of feeds and the biochemical composition of blood. This will aid specialists in enterprises to efficiently distribute feed resources and use them with maximal efficiency.

All of the work of directors and specialists must be directed at making livestock farming a high-income, highly profitable branch of agriculture

because in most kolkhozes and sovkhoses labor and feed expenditures are still large and the cost of production is very high. The reason for this is not only the low productivity of animals. An unjustifiably large amount is lost because of the barrenness of the brood herd and because of improper and unbalanced feeding of animals. In many enterprises not enough care is taken to preserve the herd. There are gross violations of state schedules and great overexpenditures in the wage fund.

It is essential to find and eliminate existing shortcomings in a timely manner and to achieve the greatest possible increase in high-quality products with fewer labor expenditures.

In the zone a great deal of work is being done to introduce industrial methods of animal production output. This is the correct way to increase the profitability of production and to decrease its cost. The effectiveness of production of milk, meat and other animal products is significantly higher in places where the transition to industrial technology is being realized. For example, in the enterprises of the Kuybyshev association of Svinoprom last year the cost of 1 quintal of pork was 134.26 rubles--61.5 rubles less than in oblast sovkhoses.

In the state specialized enterprises and inter-enterprise associations of Penzenskaya Oblast the cost of weight gain of calves is 35 rubles less than in the kolkhozes and sovkhoses of the oblast.

The introduction of new, progressive production technology for agriculture is an important condition for accelerating scientific-technical progress in agriculture. In Povolzh'ye there are over 4,000 enterprises specialized for various forms of agricultural products, over 1,000 inter-farm enterprises and associations and 235 livestock-raising complexes. There are 460 new associations serving basic production. These are mainly repair-operational enterprises.

The most important task of the day is to fight for the successful overwintering of livestock. The cadres of livestock farms should be replenished from the ranks of the best kolkhoz farmers and sovkhos workers freed from field work. The necessary conditions must be created for fruitful labor and for improving job training. The uninterrupted use of all machines and mechanisms must be organized. Scientific workers must help livestock specialists to develop balanced rations for livestock, to introduce the most effective technological processes of labor on farms, thereby enabling us to increase the production of milk, meat, eggs and wool with minimal expenditures.

In directing party, soviet and agricultural organs at solving the great problems that are before agriculture, the CPSU Central Committee obliges us to strengthen the efficiency, specificity and effectiveness of propaganda and the agitation of party documents and their relationship to life. It is necessary to elucidate the socio-economic policies of the CPSU, which are directed at raising the material well-being and culture of

the people. There must be an overall development of socialist competition and a movement for the communist attitude toward labor. There must be active encouragement of the successful completion of the goals of the 10th Five-Year Plan. The achievements of leaders and the successes of science and technology must be generalized and propagandized widely. There must be a persistent battle to strengthen labor and state discipline, to raise responsibility for assigned tasks, for economy and care and against waste in all sections of production.

Each rural worker must clearly understand the public significance of this individual participation in the fulfillment of national economic plans and in accelerating scientific-technical progress as the decisive condition for the continued strengthening of the power of our homeland and for the victory of communism.

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LIVESTOCK

KALMYKS STUDY WAYS TO IMPROVE BEEF OUTPUT

Saratov STEPNNYYE PROSTORY in Russian No 12, Dec 79 pp 34-36

[Article by G. D. Kukeyev, senior scientific associate of the Kalmyk Scientific Research Institute of Beef Cattle Raising: "Beef Quality"]

[Text] The nutritional value and quality of meat are determined by its content of protein, fat, and number of calories. Scientific research data indicate that the fatter the animals, the more nutrients the meat has. The total nutritional value of meat obtained from fatter cattle is almost 2 to 2.5 times higher than from low-average fat cattle. In other words, increasing the fatness of livestock is equivalent to increasing the volume of beef production. For example, an increase of only one percent in the specific weight of cattle sold to the state by republic sovkhozes which are of higher and average degrees of fatness makes it possible to obtain additionally over 120 quintals of nutritious meat from the same number of cattle.

The level of meat productivity and quality of animals depends on many factors and conditions. Chief among them are breed, fattening, maintenance, age, and sex. These factors produce the maximum economic effect only if they are used comprehensively.

An analysis of meat productivity of the Kalmyk breed of cows and young stock up to 8 months of age indicated that there are great differences in the genetic potentials of various classes of animals when they are kept under semi-desert conditions.

The data in Table 1 indicate that the qualitative make-up of the parent stock has a favorable effect on beef production. For example, an increase in the ratio of elite and first and second class cows in the total stock is accompanied by an increase in the number of offspring and in young stock productivity. This promotes a decline in the cost of the offspring, an increase in the weight gain of young stock up to 8 months of age, and an increase in meat production calculated per cow. As a result, profitability of beef production rises.

Table 1

The Effect of the Quality of Animals (Parent Stock) on Intensiveness and Efficiency of Beef Cattle Output on Sovkhozes in the Kalmyk ASSR (average for 1975-1977)

1	2	3	4	5	6	7	8	9	10	11
	Группы совхозов по удельному весу элитных, I и II классов животных в общем поголовье, %		Количество совхозов в группе	Удельный вес элитных, I и II классов животных, %	Приплод на 100 коров, гол.	Среднесуточный привес молодяка, г	Произведено мяса на 1 ср. годовую корову, ц	Рентабельность, %		
2	Центральная зона		24	60,2	79	311	2,3	+2,5		
3	до 50		8	30,6	77	268	2,1	-14,8		
	50-70		7	58,5	77	330	2,2	+6,1		
4	свыше 70		9	83,3	82	341	2,5	+12,4		
5	Восточная зона		23	56,2	88	355	2,8	+7,2		
3	до 40		6	25,5	82	327	2,3	-1,1		
	40-60		9	48,1	83	334	2,7	+2,1		
4	свыше 60		8	77,3	97	392	3,1	+14,7		

1. Groups of sovkhoses by ratio of elite and class I and II animals in total herd, %
2. Central zone
3. Up to
4. Over
5. Eastern zone
6. No. of sovkhoses in the group

7. Ratio of elite and class I and II animals, %
8. No. of offspring per 100 cows
9. Average daily weight gain of young stock, grams
10. Meat output per average cow, quintals
11. Profitability, %

Our calculations indicate that republic sovkhoses can obtain an additional 5,000 calves, or 7,500 quintals of meat by increasing the number of elite and higher class cows to 80 percent.

The economic effect of improving the livestock breed is 800,000 rubles.

Stimulating the role of the procurement prices of meat is very important in increasing animal productivity and quality. As of 1 May 1970, price increments were established for kolkhozes and sovkhoses for an increase in the delivery weight of young cattle (over 350 to 400 kilograms).

The grouping of sovkhoses according to the fatness of livestock sold to the state (see Table 2) indicates that the best beef is produced in the western zone where the ratio of cattle with a high degree of fatness is 64.3 percent.

Table 2

**The Effect of the Fatness of Cattle
Sold on the Profitability of Beef Produc-
tion on Sovkhozes in the Kalmyk ASSR
(average for 1975-1977)**

1 Группы совхозов по удельному весу скота высшей упитанности, %	Количество хозяйств в группе	Удельный вес скота высшей упитаннос- ти, %	Средний сдаточный вес 1 гол., кг	10 Прибыль (убыток) реализации 1 ц мяса, руб.
2 Западная зона	6	44,3	323	+15,1
3 Центральная зона	32	33,4	299	-14,4
4 до 20	8	15,9	273,8	-42,5
20-30	10	23,7	276,2	-34,9
30-40	8	32,7	305	-22,0
5 свыше 40	6	54,6	338	+29,6
6 Восточная зона	29	36,9	314	-2,1
4 до 20	7	12,0	276	-22,3
20-40	8	29,1	302	-23,5
40-60	8	44,8	339	+19,8
5 свыше 60	6	69,8	366	+29,6

- | | |
|---|--|
| 1. Groups of sovkhoses by ratio of high fat cattle, % | 7. No. of farms in the group |
| 2. Western zone | 8. Ratio of high fat cattle, % |
| 3. Central zone | 9. Average release weight per head, kilograms |
| 4. Up to | 10. Profit (loss) from the sale of 1 quintal of meat, rubles |
| 5. Over | |
| 6. Eastern zone | |

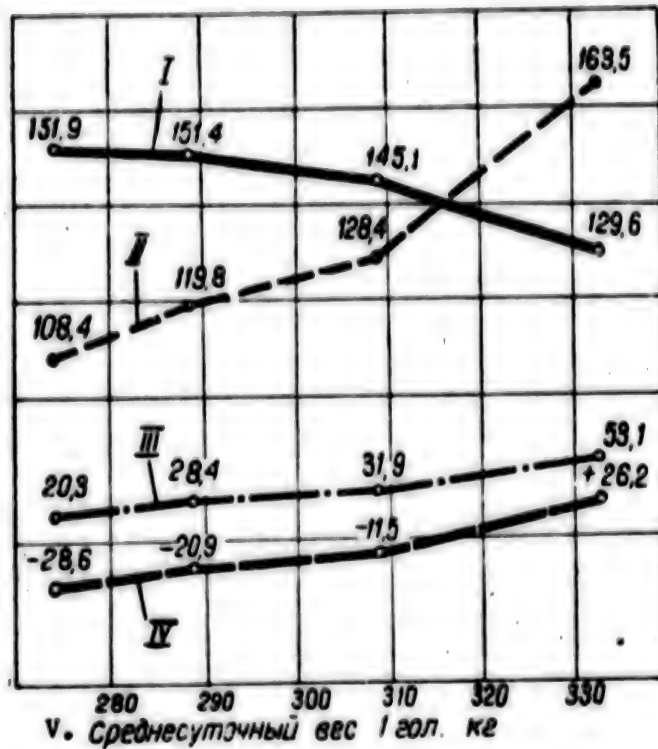
By increasing livestock fatness kolkhozes and sovkhoses achieve a higher profit from the meat (see diagram).

It must be pointed out that the dependence of product quality on the level of production outlays can sometimes fail to develop since a number of other factors also affect the overall total, for example, protein deficiency of the feed accompanied by an increase in its expenditure, high feed cost, and so forth.

As you see, the average sale price is directly dependent on the quality of the product of beef cattle raising, and its cost has a tendency to decrease.

We know that intensification of beef cattle raising is greatly determined by the intensive raising of young cattle; this promotes an acceleration in the turnover of funds, an increase in meat output, and an improvement in the release conditions by mass and quality (see Table 3).

The Dependence of Profit, Sale Price,
and Fatness of Cattle on Its Weight



I. Cost per quintal, rubles

II. Sale price per quintal, rubles

III. Higher fatness, %

IV. Profit, %

V. Average daily weight per head, kilograms

Table 3

The Dependence of Beef Production Efficiency
on the Ratio of Young Stock to the Total
Number of Cattle Sold by Central Zone Sovkhozes
(average for 1975-1977)

1 Группы совхозов по удельному весу молодняка в общей реализации скота, %	5 Количество совхозов в группе	6 Удельный вес молодняка в общей реали- зации мяса, %	7 Среднесуточ- ный вес 1 гол., кг	8 Себестоимость 1 ц мяса, руб.	9 Реализацион- ная цена 1 ц мяса, руб.
2 До 60	13	53,6	287	148,8	127,0
3 60,1-70	12	65,6	300	143,3	129,8
4 Выше 70	7	79,4	317	139,3	144,6
4 Итого по зоне	32	64,3	299	145,5	130,1

1. Groups of sovkhoses by ratio of
young cattle to total cattle
sold, %

2. Up to

3. Over

4. Total for the zone

5. No. of sovkhoses in the group

6. Ratio of young stock to total
meat sold, %

7. Average release weight per
head, kilograms

8. Cost per quintal of meat, rubles

9. Sale price per quintal of meat,
rubles

The data cited indicate that the average release weight of animals rises with an increase in the proportion of young stock in the total volume of cattle meat sales and the economic efficiency increases. Here the cost drops, and the average sale price of the meat increases. While beef production is unprofitable in the first and second groups of sovkhoses, it is profitable in the third group.

Thus, a further increase in the intensiveness and efficiency of beef production is possible through a continuous improvement in the qualitative indicators of the animals and an increase in their productivity.

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LIVESTOCK

WINTER DAIRY OPERATIONS IN ROSTOVSKAYA OBLAST

Moscow TRUD in Russian 7 Feb 80 p 1

[Article by P. Kozyrenko (Millerovo, Rostovskaya Oblast): "In Honor of the Anniversary of the Leader"]

[Text] Winter on the farms is a difficult and tense period during any year and particularly this current one. The dry summer did not produce the quantity of feed hoped for. Nevertheless, on a majority of the farms in Millerovskiy Rayon of Rostovskaya Oblast, the wintering of the livestock is being carried out in an organized manner and no reduction has taken place in the productivity of the animals. During the first weeks of January, the rayon's farms supplied the state with almost six more tons of milk than were provided during the same period last year.

The livestock breeders at the second farm of the Krivorozhskiy Sovkhoz are obtaining just as much milk as they did during the summer. Here the feed is being used only in a prepared form.

The collective is participating in an effective labor rivalry aimed at raising the quality of the products. Last year, 98 percent of the milk sold to the state was of 1st class quality. This alone resulted in the milkmaids being paid more than 5,000 rubles in bonuses. The farm's collective resolved to fulfill its five year task prior to the 110th anniversary of the birth of V.I. Lenin.

The wintering of the livestock at the Put' K Kommunizmu Kolkhoz is being carried out in an organized manner. The farm has exceeded to a considerable degree its plans for the fourth year of the five-year plan for selling all types of livestock products to the state. Here a maximum amount of attention is being given to the efficient use of the feed, to its preparation and to ensuring that the feed preparation shop operates around-the-clock. The prepared feed is delivered without delay to all of the kolkhoz's farms.

However, this is not the situation in all areas. The Rossiya and Pravda kolkhozes are obtaining low milk yields. Here the work of the livestock

breeders is not properly organized, the feed is not always prepared and the ration is not balanced in terms of feed units.

There is still one other "minor detail" and one which has become a difficult problem for the leaders of kolkhozes and sovkhoses throughout the rayon. Where is it possible to obtain ordinary electric light bulbs? It is impossible to obtain them either from stores or from Sel'khoztekhnika. Quite often the milkmaids bring bulbs with them from their dwellings and, upon departing work, take them home again. Such is the situation at the Pravda and Druzhba kolkhozes, at Kurskiy Sovkhoz and at many other farms. It is believed that the oblast trade organizations are capable of solving this problem.

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LIVESTOCK

BRIEFS

NEW CATTLE STRAIN--Riga--A promising strain of cattle -- brown Latvian-1 -- has been bred in the republic. It is the result of work carried out by a large group of scientists and specialists and it is numbered among the best achievements of the year in domestic breeding. During the war years, all of the pedigree cattle in Latvia perished and the scientists experienced difficulty in assembling 25 pure bred cows -- brown Latvian -- on the farms. It was not until two decades later, following breeding and careful selection, that success was achieved in obtaining the first generation of the new line. State certification revealed that the average yield for the brown Latvian-1 amounted to almost 5,300 kilograms of milk -- this exceeded by twofold the milk yields of local "old timers." The new strain is now being introduced on the farms on a massive scale. In the opinion of the scientists, it holds more promise for the Baltic region than does the widely known Holland strain of cattle. During the next five-year plan, these new animals on the farms will annually furnish 30,000 additional quintals of milk. The complete renovation of the herd promises an increase of more than one and a half times in the production of milk throughout the republic.

[Text] [Moscow TRUD in Russian 7 Feb 80 p 1] 7026

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AGRICULTURAL MACHINERY AND EQUIPMENT

METHODS FOR FARMING UNDER ADVERSE CONDITIONS

Minsk SEL'SKAYA GAZETA in Russian 17 Feb 80 p 2

[Article by M. Severnev, director of the Central Scientific Research Institute of Agricultural Mechanization and Economics of the Nonchernozem Zone of the USSR and VASKhNIL academician: "Under Difficult Conditions"]

[Text] Agricultural production under extreme conditions, like last year, makes a number of absolute demands on the maneuvering of the kolkhoz and sovkhos machine-tractor pool, the selection of more effective technologies, and the creation of material reserves, without which it is sometimes impossible to surmount the difficulties which arise.

An analysis of the number and list of makes in the machine-tractor pool indicates that republic farms use many low-powered machines and devices and that many technical devices are delivered in numbers which fail to create the necessary technological complexes on the farms. An improper approach to the distribution of equipment among oblasts, rayons, and farms still crops up frequently. For example, the republic's needs are being met only 9 percent for K-701 and K-700 tractors, 33 percent for T-150K tractors, and 81 percent for MTZ-80/82 tractors, while the delivery of low-power wheeled tractors exceeds the demand for them 37 percent with respect to the norms.

A method of calculating the demand for equipment by computers, which assist in keeping accounts for almost all republic farms, has been developed and introduced by our institute jointly with the computer information center of the Belorussian Ministry of Agriculture and the Sel'khoztekhpriyekt Institute of Belgoskomsel'khoztekhnika. It is necessary for agricultural and planning organs to monitor the efficient outfitting of the machine-tractor pools; this will make it possible to improve significantly the distribution of equipment among oblasts, rayons, and farms.

In addition, republic agriculture is experiencing a considerable shortage of trailer equipment, especially the powerful highly productive tractors. Thus, the value of agricultural machines is 1.9 rubles per ruble of tractor value, whereas the established norm is 2.7 rubles.

At the same time there is a shortage of coupling devices which make it possible to put together maneuverable multi-machine units to fully utilize the high-powered tractors.

The organization of the production of special couplings at Sel'khoztekhnika enterprises is a worthwhile and simple matter; we must proceed with it as rapidly as possible. The high-power tractor pool is growing, but its use efficiency is low because of insufficient loads.

In recent years the republics of the western region have substantially increased the volume of organic fertilizer applications which has not reached 100 to 110 million tons. Belorussia alone applies over 70 million tons of organic fertilizer annually. A large part of it is prepared during the winter, and over 90 percent of the total amount is applied to the field in the spring. We must keep in mind the fact that it is not possible to apply such a tremendous amount of fertilizer because of a shortage of transport and loading equipment.

The goal is to give up this practice and to apply 40 to 45 percent of the organic fertilizer in the form of peat-manure composts to winter crops and the autumn plowland during the summer and fall. Herein lies the key to further increase the yield and resistance of crops to unfavorable environmental conditions. Large-capacity transport vehicles and high-productivity loaders must be introduced more rapidly and used efficiently on the farms.

It is necessary to establish on each farm continuously operating fertility detachments which during the year will engage in the procurement, delivery, and application of organic fertilizers. The majority of the farms are forming such detachments, but only during the winter and spring periods, and this is not enough because manure accumulation is a continuous process on the farms.

As for facilities for mechanization, production still does not have high-productivity loaders to work with the type PRT-10 and PRT-16 large-load organic fertilizer spreaders attached to high-powered tractors. It is the task of scientists and designers to complete their development as rapidly as possible. It is also necessary to organize the production of PNZh-250 liquid fertilizer loaders which have been tested by the state.

Various systems for regulating the provision of moisture to agricultural crops have been widely disseminated in recent years, and especially in dry years.

In this connection, sprinkling has been employed more and more widely -- primarily to irrigate perennial cultivated pastures, hay fields, and vegetable crops.

Mainly mobile and semi-stationary sprinkling machines are being used as equipment. Stationary irrigation systems are used comparatively rarely.

Specialized teams are formed to use the watering equipment. However, a large detachment of mechanizer cadres is not a highly efficient use of labor. Even under extreme conditions -- in drought-stricken years -- the watering equipment pool is used extremely inadequately. Actually only one or two waterings are made instead of the planned four or more.

The unsatisfactory utilization of watering equipment is explained primarily by poor labor organization. However, even with normal use the quality of regulation of soil water and heat regimens is very far from optimum. This is explained by the fact that until now practice has not had at its disposal modern equipment for evaluating soil moisture, and the mobile and semi-stationary sprinkling devices being used are rated in their operation with large watering norms. The utilization of stationary irrigating systems in principle makes it possible to achieve synchronous impulse sprinkling guaranteeing frequent watering in small amounts with low labor outlays. This achieves not only optimum regulation of soil moisture, but also a favorable microclimate in the area of plant growth. However, capital outlays on the construction of such systems are huge (on the average of 4,400 rubles per hectare). A great amount of materials in short supply are required here: steel pipes, cable, and so forth.

In our opinion, the utilization of impulse sprinkling devices with an increased radius of operation is a promising trend in this direction. Tests of an experimental device developed at the Central Scientific Research Institute of Agricultural Mechanization and Economics showed that it is possible to irrigate a field of 10 or more hectares from one position. In this case an automatic regimen of water feed is assured according to a pre-set program, as is the formation of a favorable microclimate on the irrigated area. Thanks to a pneumatic hydraulic energy storage cell, the capacity of the drive does not exceed 10 to 15 kilowatts. As calculations indicate, specific capital investments in setting up the system are no greater than for the construction of a semi-stationary system based on Fregat machines. At the same time operating outlays are sharply reduced and the quality of water regimen regulation for the plants is improved.

Rice urgently requires the most rapid application of scientific achievements in the field of automatic control of the soil water regimen. The thermostat-weight method of evaluating moisture content which is in use in agricultural production is laborious and outlived its usefulness long ago. Specific experience has been gained in indirect evaluation of soil moisture reserves -- according to the drop in surface air temperature and humidity. There are test models of soil moisture monitors which have been proven in practice. The Central Scientific Research Institute of Agricultural Mechanization and Economics, for example, has tested a method of automatic control of soil moisture and the level of water in the main canals of the land

improvement system by which the information is transmitted to the farm dispatcher center. All this indicates the possibility and expediency of more active and purposeful management of plant growing conditions and a significant improvement in the efficiency of existing irrigation systems which should guarantee high yields of agricultural crops on irrigated lands.

Thus, science and practice have at their disposal many methods and much equipment for mechanization to achieve quality and prompt execution of mechanized operations under significant weather fluctuations, and it is our goal to introduce all these methods and means into agricultural production as rapidly as possible.

At the same time the consistent practice of farming under extreme conditions requires the scientific solution of a number of acute and urgent problems such as conservation of material resources at all levels of production administration, all-weather technology for the procurement of feed from grasses and the harvesting of grains, an increase in the maneuverability of tractors, self-propelled machines, and heavy-freight transport vehicles, progressive methods of moisture accumulation in the soil and the means for its automatic control.

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ORENBURGSKAYA OBLAST NEEDS GRAIN CLEANING COMPLEXES

Moscow ZERNOVOYE KHOZYAYSTVO in Russian No 12, Dec 79 pp 15-16

[Title] by Yu. G. Matveyev, deputy chief of the Production Administration of Agriculture of the Orenburgskaya Oblast Executive Committee, P. R. honored agronomist, and A. G. Kryuchkov, head of the Division of Grain Breeding of the Orenburg Scientific Research Institute of Agriculture: "A Modern Cleaning Base for Grain Farming"

[Text] The solution of the problem of improving the postharvesting processing of grain and seeds acquires special significance in the country's large grain regions, which also include the steppe part of the Southern Urals represented mainly by Orenburgskaya Oblast. During favorable years the gross output of grain reaches 8 to 8.5 million tons there and will even increase in the near future. The proportion of strong and durum wheat in it will also increase considerably. Therefore, there is the problem of the need to improve the process of harvesting and, especially, postharvesting processing of grain.

The state of this work in Orenburgskaya Oblast does not meet modern requirements. Harvesting time is almost twice as long as that established according to the standards. Throughout the oblast grain crops are harvested in 37 to 57 days. Owing to the poor material and technical base the postharvesting processing of grain is not carried out within the standard time (300 hours for grain and 500 hours for seeds). As a result, considerable grain masses are accumulated on open threshing floors.

The ZAV-20 and ZAV-40 units, which are most widespread in the oblast, do not satisfy farms owing to their low productivity, lack of accumulating capacities, insufficiently high quality of seed cleaning and so forth. Moreover, individual ZAV-20, ZAV-40 and other units do not solve the problem of flow processing. Complexes ensuring the acceptance, processing, drying and shipment of grain in flow without unloading it on sites are necessary.

What basic demands are now placed on complexes for the postharvesting processing of grain and seeds in Orenburgskaya Oblast?

Our investigations have shown that, on the average, the threshing floors of individual farms annually receive 500 to 33,000 tons of grain (data for 1974-1976 on 508 farms). However, the bulk of the farms (89 percent), on the average, receive from 2,000 to 15,000 tons. Almost one-half of them gather from 5,000 to 10,000 tons and 11 percent produce more than 15,000 tons of grain. During individual years (1978) large kolkhozes and sovkhoses gather 30,000 to 45,000 tons of grain and more. This means that Orenburgskaya Oblast needs complexes and plants for the postharvesting processing of grain with the following seasonal productivity: up to 5,000 tons, 27 percent of the farms, 10,000 tons, 43 percent, 15,000 tons, 19 percent, 20,000 tons, 6 percent, 25,000 tons, 3 percent and 30,000 tons, 2 percent. In the future the need for complexes and plants with an increased seasonal load will rise. Complexes for 10,000 to 20,000 tons and plants for 25,000 to 50,000 tons will become the basic production unit.

To substantiate the flow sheet of the complex (plant), we analyzed the initial data of the State Grain Inspectorate on the physical qualities (moisture and impurity) of grain for 1974-1976. It was established that under our conditions the weighted mean moisture of grain crops was 13.7 ± 2.02 percent ($\sigma = 2.02$ percent). However, during a more detailed analysis of the groupings of grain batches it was detected that a moisture of 16 to 20 percent was characteristic of 17 percent of the spring wheat and of 6 percent of the barley.

The greatest amount of wheat in need of 1 to 4 percent drying and more was detected in the northern zone (51.3 percent). The central and eastern zones (14.5 percent) were in the second place. Only under the conditions of western and southern zones was it necessary to dry 4 to 10 percent of the grain. In practice, all the barley (95.4 to 99 percent) received from farms in northern and western zones, one-third of the barley received from farms in the eastern zone and one-fifth of the barley received from central and southern zones requires drying. As a rule, rye, millet and buckwheat grown in the northern zone need drying.

Complexes and plants equipped with drying devices of the type of active ventilation hoppers should become most widespread in the oblast. Dryers of the shaft (rhombic) or other types can be used on specialized seed breeding farms, experimental model farms and educational farms of scientific and educational institutions.

Active ventilation hoppers of a capacity of 25 to 50 tons are now delivered to Orenburgskaya Oblast. Practice shows that this is not enough. In the oblast (for the most part at cleaning centers) accumulating capacities for ensuring a continuous unloading of motor vehicles are manufactured and their total volume is increased to 200 or 600 tons and more. However, they are good when dry grain is received. If it is moist, the flow nature of the process is disrupted. Active ventilation hoppers would be of help here, but they have a small volume. More capacious hoppers (up to 100 or 200 tons) with a stronger drying are needed.

Our investigations have shown that the flow sheet of grain cleaning also needs to be improved. It should be more complicated as compared with the present one as a result of the use of additional wind screen machines and grain cleaning units. The double passage through the ZAV-20 and ZAV-40 units is not efficient, lowers the rates of grain preparation and increases its traumatization.

The transportation of grain and seeds by means of motor vehicle trains of a freight capacity of up to 30 tons and K-700, K-701 and other tractor trailers is gaining in scope. However, it is hampered by an acute shortage of 30-ton scales and heavy-freight lifts on threshing floors. Their production should be increased.

Special demands should also be placed on seed cleaning complexes. Of the presently recommended plans none fully meets the oblast conditions either because of low productivity, complexity of construction or lack of coordination of the sorting part of the complex with the cleaning part. Therefore, we try to redesign the ZAV-20 and ZAV-40 grain cleaning units into seed cleaning units and we also build experimental complexes.

What basic demands does practice make? First of all, the complex should have a heavy-freight receiver, an intake pit of an increased capacity and active ventilation hoppers for 200 to 400 tons and more. Cleaning machines should cope with the daily arrival of grain, that is, in 10 hours (before the beginning of combine operation) they should process all the received heap dried in hoppers (if this is needed).

Precleaning machines should be equipped with removable sieves with an increased set. This will improve the quality of operation and productivity of sorters. More powerful grain cleaning units (up to 20 tons per hour) with removable cylinders having different diameters of meshes are also needed. It is advisable to lengthen the path of passage of seed through grain cleaning cylinders by supplementing the flow sheet with grain cleaners having large meshes (removal of wild oats from barley and wheat) and small ones (removal of difficultly separable impurities from millet).

Complexes need more productive seed cleaning attachments. The point is that, as a rule, on the oblast farms commodity grain is cleaned on several units. Any one unit is assigned for cleaning seeds. With such work organization the productivity of a unit in sorting is immediately lowered, which leads to a delay in the time of seed preparation, and this operation is performed during the fall and winter period. The conditions of storage and the presowing preparation of seeds are also complicated. However, the installation of two attachments and more complicates the design.

The productivity of the PSS-2,5 and PSU-3,0 pneumatic sorting tables is low. A large complex must have about 10 of them.

The changeover to seed processing on highly productive flow lines and complexes forces us to pay special attention to outfitting them with equipment preventing traumatization. It is well known that seeds are least of all subject to traumas if their moisture is within 14 to 18 percent. In connection with the fact that many seed batches in Orenburgskaya Oblast have a moisture ranging from 7 to 14 percent, the degree of their traumatization is much (1.5- to 2-fold) higher than the "critical" degree, that is, it reaches 40 to 45 percent. Therefore, in complexes along the path of movement of the seed heap the possible replacement of metal surfaces with plastics and wear resistant rubber should be envisaged.

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TILLING AND CROPPING TECHNOLOGY

GRAIN PRODUCTION ON IRRIGATED LAND IN VOLGA ZONE

Saratov STEPNYYE PROSTORY in Russian No 10, Oct 79 pp 18-20

[Article by V. A. Dimitryuk, A. M. Matveyeva and G. B. Shmagina, Povolzh'ye branch of VNIIESKh [All-Union Scientific Research Institute on the Economics of Agriculture]: "Producing Grain with Irrigation"]

[Text] The goal that was presented by the 25th party congress and the July 1978 Plenum of the CPSU Central Committee of significantly increasing grain production in the country and of raising the stability of grain farming requires the rapid utilization of all resources existing in agricultural production. The most important of these, in addition to improving the structure of sowing areas and the agrotechnology of cultivating grain crops, introducing high-yield varieties and hybrids, effectively utilizing mineral and organic fertilizers and herbicides is the maximal increase of grain crops on irrigated lands.

In the future it is planned that the irrigated lands of the Povolzh'ye will produce stable annual harvests of 13-14 million tons, and 18-20 million tons when a productivity of 40-45 quintals per hectare is reached. Within a 10-year period losses due to drought can be decreased by about 3-4 billion rubles thanks to irrigated lands. This will accelerate the return on capital investments for irrigation building.

In recent years the area in grain crops on irrigated lands in the kolkhozes and sovkhoses of Povolzh'ye have increased significantly. Whereas in 1971 they occupied 70,700 hectares, in 1977 they covered 176,300 hectares, an increase of 2.5 times. During this period the gross grain yield increased from 1.5 to 4.5 million quintals or by a factor of 2.9.

However, research has shown that the increase in gross grain production on the irrigated lands of Povolzh'ye occurs basically because of the expansion of sowing area, while the average productivity of grain still remains lower than the potential and comprised only 23.9 quintals per hectare on the average for 1971-1977. Meanwhile, many leading enterprises, brigades and links produce 45-50 quintals per hectare and more. In connection with the significant fluctuations in productivity the efficient utilization of irrigated lands when grain crops are sown acquires a priority importance.

Among the factors determining the effectiveness of grain production on irrigated lands the deciding factors are the concentration of irrigated lands, the supplies of fixed production capital in enterprises and energy capacities.

A study of the effect of these indicators was made in 132 grain-livestock kolkhozes and sovkhozes of Saratovskaya Oblast, which has over 400 hectares of irrigated lands. The areas of irrigated plowland in the group that was analyzed differed greatly and fluctuated between 393-3,013 hectares. The proportion of irrigated plowland as compared to total area varied between 3 and 35 percent. Of the aforementioned number of enterprises 20.5 percent have 46.1 percent of all crops under irrigation.

The structure of the sowing area on irrigated lands, while being a part of the general crop structure, has its own characteristics.

Whereas in the total sowing area of enterprises in the oblast grain crops occupy 72.5 percent, on irrigated lands of the same enterprises their proportion decreases to 28.1 percent. A somewhat larger percentage (36.5) is found in grain-livestock farming enterprises. At the same time under irrigation conditions there is a sharp increase in the proportion of feed crops, comprising 62.6 percent as compared with 20.6 percent in regular crop stands.

An analysis of the obtained data indicated that the following tendencies have been observed according to the size of the increased concentration of irrigated lands as well as in absolute numbers and in a percent ratio:

- Productivity increases. The growth of the proportion of irrigated plowland in the total area has a noticeable effect on increasing the productivity of grains on the entire sowing area;

- The total area of plowland per enterprise decreases. Whereas in the group of enterprises having up to 10 percent irrigated lands the average enterprise has 14,500 hectares of plowland, the enterprises with over 20 percent of the area under irrigation experience a decrease in plowland to 9,000 hectares.

- There is an increase in the supply of resources in enterprises (in some cases by a factor of 1.6) per hectare of plowland and in the capital-labor ratio by a factor of 1.3.

- There is an increase in the use-level of land. In the group of enterprises with a greater than 20 percent proportion of irrigated plowland gross production output per hectare of plowland was 84.6 rubles, or 1.4 times more than in the group of enterprises having up to 10 percent of their land under irrigation.

Thus, with an increase in the concentration of irrigated lands in grain-livestock farming enterprises there is an increase in the level of

The Effect of Various Concentrations of Grain Crops in the
Total Area of Irrigated Lands on the Effectiveness of
Production in the Kolkhozes and Sovkhozes of Saratovskaya
Oblast (1975-1977)

Indicators	Groups of Enterprises According to Proportion of Grain Crops in Total Sowing Area, %			
	up to 30	30.1-40.1	40.1-50.0	50.1 and more
Number of enterprises	63	24	17	13
Average per enterprise:				
plowland, thousands of ha..	13.5	16.7	11.9	11.2
including irrigated.....	0.8	1.1	1.4	2.7
Fixed production capital for agricultural purposes in farming per hectare of plow- land, rubles	135.8	192.6	214.3	291.7
Proportion, %:				
of grain crops under irriga- tion and areas of irrigated plowland.....	15.3	36.5	46.7	62.4
of grain crops under irrigation as compared to total area in grains.....	0.9	4.3	5.6	17.2
of gross grain production from irrigated lands.....	2.2	10.5	15.9	37.6
Gross farming production, rubles, calculated on the basis of:				
a hectare of plowland.....	61.8	62.8	63.5	81.3
a ruble of fixed production capital for farming.....	0.45	0.44	0.30	0.28
Productivity, quintals/ha:				
of grain crops.....	8.0	7.8	7.3	10.2
including under irrigation.	18.3	19.1	20.5	22.4

intensification of irrigated farming, which is attested to by the growth of the capital supplies per hectare of plowland and of the capital-labor ratio, by the growth in the productivity of grain crops which in turn results in the continued increase in production volume. This tendency is most clearly evident in enterprises that have over 1,000 hectares of irrigated plowland. From this we can draw the conclusion that in kolkhozes and sovkhozes with a total area of irrigated lands of up to 1,000 hectares it would be expedient to irrigate only feed crops and only if the area exceeds 1,000 hectares to plan grain crops for the crop rotation.

It should be noted that in the kolkhozes and sovkhozes of Povolzh'ye insufficient attention is given to this factor. Thus, of the 275 enterprises of Astrakhanskaya, Volgogradskaya, Kuybyshevskaya and Saratovskaya oblasts in 149 grain crops are put in irrigated plots with a total area of 500 hectares and a proportion of grains of up to 10 percent.

The structure of the sowing area has a great effect on the effectiveness of irrigated farming. The proportion of grain crops in the total crop area under irrigation was made the basis for determining the effect of the given factor on production effectiveness in consideration of the grain-livestock farming direction of the enterprises in the group (see table).

As the data that is presented demonstrates, the increase in the crop concentration on irrigated lands has the following effect on the production effectiveness of the groups of enterprises:

--Productivity increases. In the enterprises of the fourth group it was 22.4 quintals per hectare as compared with 18.3 quintals per hectare in the group of enterprises with a proportion of grains of up to 30 percent;

--Capital supplies per hectare of plowland increase from 135.8 to 291.7 rubles;

--There is a tendency toward a more efficient utilization of land. Gross production output per hectare of plowland increased from 61.8 to 81.3 rubles or by 32 percent with the increase in the proportion of grain crops. The best indicator of production effectiveness is found in enterprises in which the proportion of grains under irrigation exceeds 50 percent of the crop area.

One of the most important conditions securing an increase in the economic effectiveness of irrigated farming is the equipping of enterprises with fixed production capital.

In order to evaluate the effect of various levels of capital supplies on production effectiveness in given enterprises two characteristics were utilized simultaneously for statistical groupings--the level of capital supplies (fixed production capital in farming per hectare of plowland) and the proportion of irrigated plowland in its total area.

According to the level of capital supplies the enterprises under study were formed into four groups: the first--with fixed capital for farming of up to 100 rubles per hectare of plowland; the second--101-200 rubles; the third--201-300 rubles and the fourth--over 300 rubles. Within the aforementioned groups the enterprises are distributed among four subgroups according to the proportion of irrigated plowland in its total area within the limits of from 5.0 to 20 percent and more.

An analysis of the resulting data showed that with an increase in the level of capital supplies according to groups of enterprises there is a tendency to improve the economic indicators of production and to more effectively utilize lands. Whereas in the first group of enterprises (up to 100 rubles of capital per hectare of plowland) gross farming production output, per hectare of plowland was 59.4 rubles, in subsequent groups with the increase in the capital supplies per hectare production equalled 61.0, 72.9 and 94.5 rubles respectively. The productivity of grain crops according to groups of enterprises increases from 6.8 to 10.4 quintals per hectare.

For all groups of enterprises with different levels of supplies of fixed production capital if there was an increase in the concentration of irrigated lands then the tendency to increase the effectiveness of production, the use of land and the growth of productivity remained.

The maximal and more effective level of fixed capital supplies for farming was an average of 421 rubles per hectare of plowland for grain-livestock farming enterprises. Bringing capital supplies of the analyzed group of enterprises to the aforementioned level will enable us to significantly raise the effectiveness of utilizing irrigated lands.

The effective utilization of irrigated lands is greatly determined by the level of energy supplies in the enterprise. The data from the groupings made with a consideration of the level of energy supplies in enterprises and the proportion of irrigated lands showed that 30 percent of the studied enterprises had an energy capacity of up to 1 horsepower, 48 percent of the enterprises--from 1 to 1.5 horsepower and 22 percent--from 1.6-2.1 horsepower.

The obtained data shows that the greatest production output per hectare of plowland is achieved in enterprises having energy supplies of over 2 horsepower. Gross production output per hectare of plowland there comprises 115.4 rubles or 2.1 times more than in the kolkhozes and sovkhoses with minimal energy supplies.

In these enterprises the productivity of grain crops under irrigation comprised 23 quintals per hectare as compared with 20.7 quintals per hectare in poorly supplied enterprises.

An analysis of the indicators of kolkhozes and sovkhoses having the same level of concentration of irrigated lands shows that with the increase in energy supplies there is an increase in gross production according to groups from 48.9 to 115.4 rubles per hectare of plowland, or by a factor of 2.4.

The aforementioned results of research on groups of grain-livestock farming enterprises enabled us to single out and provide a basis for some ways to raise grain production effectiveness in kolkhozes and sovkhoses and to more efficiently utilize irrigated lands in the Povolzh'ye. The basic ways are as follows:

1. Increasing the concentration of areas of irrigated lands and of crops on those lands. According to the study of the group of grain and livestock-farming enterprises an improvement in the indicators of the utilization of land for grain crops was noted when the area under irrigation surpassed 1,000 hectares or when grains made up no less than 50 percent of the total sown area.

2. Raising the level of supplies of fixed production capital and energy resources for enterprises.

An analysis of the work of enterprises in Astrakhanskaya, Volgogradskaya, Kuybyshevskaya and Saratovskaya oblasts showed that in grain and livestock-farming enterprises supplying plowland with fixed production capital and with energy sources is not at all the same. To a significant degree this decreases the effectiveness of production and at the same time attests to the great reserves for raising the economic effectiveness of irrigated farming. In enterprises of the given specializations the economic results increase significantly under the existing volume and conditions of production when each hectare of plowland receives 420 rubles of fixed production capital for farming and over 2 horsepower energy supplies.

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TILLING AND CROPPING TECHNOLOGY

MEASURES FOR COMBATING RODENTS DISCUSSED

Tashkent SEL'SKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 1, Jan 80 pp 48-49

[Article by K. Allabergenov, junior scientific worker at the Institute of Zoology and Parasitology of the Academy of Sciences for the Uzbek SSR: "Measures for Combating Rodents"]

Text] In the interest of protecting agricultural crops, a constant campaign must be waged against harmful types of rodents. The following methods are available for conducting such a campaign: agrotechnical, mechanical, chemical and biological. During the course of preparing measures, the life style and harmful effects of the rodents, as well as their numbers, must be taken into account.

The agrotechnical method makes it possible to limit in a strict manner the density of and colonization by the rodents and to destroy them at an intensive rate.

When carrying out such destruction work, attention must be focused on the following measures:

a) harvesting the crops in a timely manner and without losses, removing rubbish, rocks and clutter from the fields and destroying plant residues;

b) carrying out deep plowing -- this serves to destroy the rodent burrows and nests. While the rodents are thus perishing, predatory birds or mammals may also be exterminated;

c) devote special attention to autumn plowing, harrowing of the lands and to the timely cultivation and tilling of the crops;

d) reducing the amount of long-fallow land to a maximum degree and eliminating uncleared tracts which remain among fields and around areas under crops. All weeds should be removed on a regular basis from the edges of fields, road shoulders, dams of canals and irrigation networks.

Chemical method for combating rodents. Use is made of various toxic preparations, particularly poisonings having a very sharp effect (zinc phosphide and others). Successful use is also being made of anticoagulants, of which the principal ones are warfarine, brodifacoum and ratindan. For combating the Turkestan rat, household mouse, grey hamster and red-tail gerbil, it is recommended that use be made of bait containing 5 percent brodifacoum and grain lures having 5 parts of zinc phosphide and two parts of vegetable oil for every 100 parts of grain.

The Institute of Zoology of the Academy of Sciences for the Uzbek SSR recommends and uses ammonia liquor for combating rodents.

The chemical method is employed in various areas for combating rodents by the oblast and rayon sanitary epidemiology stations. By agreement with the farms, they carry out appropriate work while preparing the necessary preparations and required implements in advance. With regard to combating harmful rodents in housing and farm facilities, this work is being carried out on a regular basis by state organs, in accordance with special instructions.

Mechanical method for combating rodents. As a rule, synanthropic types of rodents -- household mouse, grey and Turkestan rats, red-tail gerbil and others -- multiply at an intensive rate under favorable conditions. During such periods the rodents colonize on an extensive scale, especially in housing facilities, warehouses, granaries, fruit storehouses, mills commodity dairy farms and in other areas.

Various types of traps, presses and mousetraps are used for destroying rodents; they are placed immediately in front of the entrance to a burrow. Food bait is attached to the trigger arrangement.

Systematic watering of the land is also employed during the spring and autumn periods for destroying the rodents on a massive scale.

Biological method for combating rodents. Use is made of natural enemies of rodents -- microorganisms which are pathogenic to them, but safe for humans and domestic animals. In nature, harmful rodents are destroyed in great numbers by predatory animals -- mammals (foxes, jackals, weasels, ermines, wildcats and others), predatory birds (buzzards, common kestrel, owls, kites, marsh hawks and others) and by reptiles (certain snakes and the grey monitor lizard).

In populated areas, a considerable role is played by domestic cats and dogs, which also destroy harmful rodents in housing developments, warehouses, barns and livestock facilities.

Rodents, mainly the red-tail gerbil and the grey hamster, constitute the principal food of weasels and foxes in the Adyry foothills, in non-irrigated plantings and in areas adjoining such plantings in Chustskiy,

Kasanskiy and Yangikurganskiy rayons of Namanganskaya Oblast and in Knodzhaabadskiy and Leninskiy rayons of Andizhanskaya Oblast. In view of the great role played by predatory animals in destroying rodents, every attempt must be made to protect such animals.

A technology for the preparation of bacteria cultures based upon dense granulated culture mediums and also an instruction on the production and use of bacteria cultures for combating rodents were developed at the All-Union Institute of Agricultural Microbiology. Rodents willingly consume a bait having a bacterial culture based upon a yeast medium. In actual practice, dry bacterial cultures possess considerable advantages over liquid ones. Two types of a dry preparation are being used: grain and amino acid bactero-dentside. These preparations bring about mass destruction of the rodents.

For the carrying out of modern measures aimed at combating harmful rodents, special importance is attached to forecasting their numbers. It must be borne in mind that measures carried out during a period when there is a minimal number of rodents make it possible, more rapidly and with less expenditures, to prevent an increase in the number of rodents. The best time for composing a forecast is early spring (in the Fergana Valley -- from 15 February to 5 March). Following unfavorable weather conditions, the number of rodents is minimal and they remain on small tracts. Based upon the wintering conditions, the status of the feeding base and the weather during the past year, a conclusion can be drawn regarding the possible damage to be sustained during the current year and, it follows, the preventive measures which must be taken in order to reduce the number of rodents.

An autumn accounting of the number of rodents is necessary in those instances where measures were not employed against them in the spring and their number increased during the spring and summer.

TILLING AND CROPPING TECHNOLOGY

RESULTS OF EXPERIMENTS IN INCREASING DEPTH OF ARABLE LAYER

Tashkent SEL'SKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 1, Jan 80 p 39

[Article by K. Mamadzhanov, E. Egamberdiyev, S. Suleymanov and R. Nurmatov of the Institute of Experimental Plant Biology of the Academy of Sciences for the Uzbek SSR: "Effect of Deep Plowing"]

[Text] In the decisions handed down during the July and November (1978) plenums of the CPSU Central Committee, important tasks were defined for achieving further improvements in livestock husbandry.

The efficient utilization of land areas assigned for forage crops is considered to be of tremendous importance for the carrying out of these tasks.

An important reserve for raising the cropping power of crops in a cotton-alfalfa crop rotation plan is that of increasing the depth of the arable layer by means of deep loosening and the application of organomineral fertilizers by layers. Experiments were carried out in this regard during the 1973-1975 period at an experimental base of the Institute of Experimental Plant Biology of the Academy of Sciences for the Uzbek SSR. Several variants were tested.

The first variant -- conventional plowing to a depth of 30 centimeters with furrow slice inversion. In the spring of 1973, alfalfa with corn was sown on this field and in 1974 pure alfalfa remained. In 1975, following three cuttings of alfalfa, the soil was plowed to a depth of 40 centimeters and thereafter corn was sown.

The second variant -- plowing with furrow slice inversion to 30 centimeters, with simultaneous loosening of the soil to 60 centimeters. Subsequently, everything was the same as in the first variant, with the exception of the alfalfa being plowed to a depth of 60 centimeters.

In the third variant, plowing with furrow slice inversion was carried out to 30 centimeters, with simultaneous loosening of the soil to a depth of 60

centimeters and an application, by layers, of phosphorus-potassium fertilizers, in a mixture with organic fertilizers and to depths of 15, 30 and 60 centimeters. Later, alfalfa with corn was also sown, the alfalfa was plowed to a depth of 60 centimeters in 1975 and thereafter corn was sown.

In the fourth variant, the plan for the experiment was similar to the third variant, with the exception of the sowing of Sudan grass instead of corn following the plowing of the alfalfa.

During the experiment use was made of the Tashkentskaya-1 alfalfa variety, for spring sowing -- Dnepropetrovskaya 338 and for secondary sowing -- Krasnodarskaya 1/49 and also Krasnodarskaya 5 Sudan grass.

For the spring sowing of corn with alfalfa, 150 kilograms of nitrogen, 130 kilograms of phosphorus and 80 kilograms of potassium were applied. The fertilizer dosages for the summer sowing of corn were 200, 140 and 100 kilograms respectively and the nitrogen norm was increased to 300 kilograms for the Sudan grass.

The observations revealed that the best conditions for the development of the spring sown corn and the alfalfa occurred in the third variant, where the fodder yield amounted to 731 quintals per hectare, including, including grass -- 176.2 quintals. This amounted to 199.2 and 60.1 quintals more respectively than were obtained in control (first variant) and also 83.6 and 25.8 quintals more than the indices for the second variant.

Following the harvesting of the corn for silage during the phase of milky-waxy ripeness of the grain, one full-value cutting of alfalfa was obtained in 1973, five cuttings in 1974 and three cuttings in 1975. In all, during the two and a half years of the alfalfa stand, the hay yield for the first variant amounted to 316 quintals, for the second -- 358 and for the third -- 390 quintals per hectare. In other words, as a result of loosening the soil to a depth of 60 centimeters, the average yield of alfalfa hay during the years of the study increased by 42 quintals per hectare. Loosening combined with fertilizer applications by layers furnished 74 additional quintals of hay per hectare compared to control.

Against a background of deep loosening and deep summer plowing of the alfalfa (second variant), the corn of the summer sowing furnished 62.5 quintals of fodder than was obtained using the conventional agricultural method and against a background of deep loosening combined with fertilizer applications by layers, the increase reached 111.3 quintals per hectare.

An especially high fodder yield was obtained from the fourth variant, that is when Sudan grass was sown following the deep summer plowing of alfalfa. The latter crop furnished 1,308 quintals of fodder per hectare from two cuttings.

In all, during the years of the study the greatest feed unit yields were obtained for the variants which involved deep loosening of the soil and fertilizer applications by layers.

Against the background of deep summer plowing of alfalfa and the sowing of Sudan grass, the feed unit yield increased by 62.2 percent.

Similar results were obtained during an experiment carried out in 1975 in behalf of the 1976 harvest. Thus, against a background of deep summer plowing of alfalfa, 62.5 quintals of grain and 258 quintals of dry stalks were obtained from corn sown during the summer, compared to only 58.9 and 251.3 quintals respectively following conventional plowing.

Similar regularities were noted during a production experiment carried out at the Kommunizm Kolkhoz in Yangiyul'skiy Rayon of Tashkentskaya Oblast.

Hence, deep loosening combined with fertilizer applications by layers promote a considerable increase in the cropping power of feed crops.

The value of this method lies in the fact that it enriches the soil considerably with humus and biological nitrogen.

The advantage of deep summer plowing of alfalfa, compared to conventional autumn plowing, lies in the fact that it prevents the alfalfa from sprouting in the spring of the following year, since the root and crop residues are planted deep.

Deep loosening of sown alfalfa can be carried out using deep rippers available on the farms and, in those areas where such equipment is not available, using existing plows equipped with appropriate organs under kolkhoz and sovkhos workshop conditions. Towards this end, subsoil and marsh plows are also considered to be suitable.

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CSO: 1824

TILLING AND CROPPING TECHNOLOGY

HIGH-QUALITY SEED REQUIRED FOR VOLGOGRADSKAYA OBLAST

Moscow PRAVDA in Russian 19 Feb 80 p 1

[Article by V. Goncharov and V. Maksimov, head of Editorial Department of VOLGOGRADSKAYA PRAVDA Newspaper, Volgogradskaya Oblast: "You Reap What You Sow"]

[Excerpts] The snow which fell generously throughout Volgogradskaya Oblast has disrupted somewhat the customary operational rhythm of the farmers. The grain growers are glancing more frequently at the calendar. Only a short period of time remains before the commencement of the sowing operations. The workers in Volgogradskaya Oblast must plant grain crops on an area of almost 2.5 million hectares. The future harvest will depend to a considerable degree upon the type of seed placed in the soil.

"The majority of the oblast's kolkhozes and sovkhoses have at their disposal regionalized high quality seed for their spring crops" stated a department head of the agricultural administration of the oblast executive committee, I. Varakuta, "There are more than 509,000 tons of such seed in the storehouses. Approximately 99.9 percent is quality-standardized. Many have achieved high indices for their preparation of the grain.

However, by no means has fine seed been prepared in all areas. At the Polyana Revolyutsii and Lebyazh'ya Polyana sovkhoses in Sredneakhtubinskiy rayon, large batches of wheat and barley became badly contaminated. The work of cleaning it and raising its classification poses no special difficulty, since the required equipment is available. However, this important work was left, as the saying goes, until "later."

Here, the work rests mainly with the leaders and specialists of the kolkhozes and sovkhoses. At the same time, the workers attached to the agricultural plants do not appear overly interested in the problem. The farmers in Sokol'skiy and Podtelkovskiy rayons have less than 50 percent of the seed they require. On the other hand, a strong insurance reserve of seed has accumulated in Kalachevskiy, Novoanninskiy and Mikhaylovskiy rayons. The situation is an obvious one. The exchange of grain must be accelerated.

At the present, large tracts of land are still being sown in varieties which are not the most productive ones and which furnish grain of low quality.

SC: 1824

ANALYSIS OF THE USE OF FISHING PORTS' FIXED CAPITAL

Moscow RYBNOYE KHOZYAYSTVO in Russian No 11, Nov 79 pp 70-73

[Article by V. I. Yarosh of the Azov-Black Sea Scientific Research Institute for Fisheries and Oceanography. "Analysis of the Use of Fixed Capital of the Fishing Seaports"]

[Text] We have established that output per worker in the fishing seaports of the Azcherryba VRPO [Azov-Black Sea Fisheries Production Association] in 1970-1977 was 40 percent dependent upon the level of fixed capital utilization. Research on the statistical relation between the value of the fixed capital and output per worker in the Kerch' Fishing Seaport in 1970-1977 showed that the increase in capital by 2-fold led to a rise in the actual output per worker by more than 4-fold, that is, an increase of 4.4 conditional units of fixed capital provided an increase in labor productivity of one port worker by 0.001 conditional unit.

The results obtained by employing correlation research methods can be considered in analyzing the work of the fishing seaports both in the sector as a whole and in planning work.

Research on the trends in the change of the return on investment and determining the quantitative influence of the various factors on its value can be examined from the example of the operation of the fishing seaports of the Azov and Black Sea Basin.

In recent years the fleet of the fishing industry in the basin has received new vessels of different types. This has required the prompt and organized processing of the vessels in the fishing seaports.

From 1970 through 1977, the fixed capital of all the industry of the basin increased by 1.07-fold, the volume of sold product increased by 1.16-fold, while the return on investment declined by 38.5 percent.

Over the same period, the fixed capital of the fishing seaports increased by 1.04-fold, the volume of total cargo turnover by 2.19-fold, and maritime cargo turnover by more than 2.5-fold, the volume of services performed increased by 2.53-fold, and the return on investment by just 1.09-fold.

1976. For the utilization of fixed capital in the individual fishing basins of the basin differed significantly from the average amount.

Table 1 shows the changes in the return on investment, labor productivity and the capital-to-labor ratio depending upon the volume of work carried out by the fishing seaports in 1976.

Table 1

Fishing seaports	Relative volume of work performed, %		Return on investment per ruble of fixed capital, rubles	Labor productivity per man, 1,000 rubles	Capital-to-labor ratio per man, 1,000 rubles
	Total cargo turnover	Volume of services provided			
1st group	41.2	39.3	0.31	6.28	25.3
2nd group	34.7	35.9	0.26	4.8	18.3
3rd group	13.6	21.9	0.18	3.92	27.2
4th group	5.5	2.9	0.09	2.27	24.5
5th group	100.0	100.0	0.24	5.14	21.4

It can be seen that with an increase in the scale of production, labor productivity and the return on investment increased with a decrease in the capital-to-labor ratio.

The fixed productive capital of the ports has had a significant effect on increasing the return on investment. With an increase in the utilization volume, the active portion of this capital should

be taken into account. This makes it possible to establish the form and quantitative dependence of the return on investment indicator upon the proportional elements of the productive capital.

Table 2 shows the empirical regression line in our example in the form of the relationship in the shape of a second-order polynomial.

The data have been taken for three ports in 1976.

Statistical indicators for determining the dependence of the return on investment upon the proportional amount of the active portion of the productive capital, shown in Table 3.

The regression equation serves as the measure of the statistical dependence (the theoretical) found for the equation and the formula:

Table 2

Fishing Seaports	Return on investment in 1976	Proportional amount of active part of fixed productive capital	
		Total	Including machinery and equipment
Sevastopol'	0.31	36.8	8.7
Kerch'	0.26	46.3	5.2
Il'ichevsk	0.18	25.8	7.3

$$\sigma_{YX} = \sqrt{\frac{\sum (Y - \bar{YX})^2}{n}} = \sqrt{\frac{0.00753}{3}} = \sqrt{0.00251} = 0.0501,$$

which is ± 0.0501 ruble.

The values of $\bar{YX}$ can be found from the equation:

$$\bar{YX} = a_0 + a_1x + a_2x^2,$$

where a_0 , a_1 and a_2 --constant coefficient.

The values of the coefficients are found using the least square method (including the Doolittle method which is a modification of the Gaussian methods) by solving the normal equations.

The calculated values of the coefficients are substituted in the equation of the curve which then assumes the form:

$$\bar{YX} = 0.32916 - 0.00945x + 0.00019x^2,$$

where $\bar{YX}$ --the average return on investment with the set values of x , rubles;
 x --proportional amount of the active part of fixed productive capital, %.

Let us establish the closeness of the relation of the capital structure to the return on investment, that is, the amount of variability (variation) in the studied aggregate calculated from the correlation equation. With a non-linear form of the relation, it is determined by the correlation ratio η .

For determining the correlation ratio of the criteria X and Y , let us calculate the mean square of the deviation (the dispersion), the standard deviation and the coefficient of the correlation ratio (the coefficient of variation).

Table 3

Местность	X	Y	X ²	Y ²	XY	(X - $\bar{X}$) ²	(Y - $\bar{Y}$) ²	(X - $\bar{X}$)(Y - $\bar{Y}$)	$\bar{X} - \bar{Y}$	$(\bar{X} - \bar{Y})^2$	$\bar{Y}X - \bar{Y}^2$	$(\bar{Y}X - \bar{Y}^2)^2$		
1 Севастопольский	20.0	41	400.00	1681.00	820.00	439.00	135.72	123916	0.07084	0.00501	0.00350	-0.01064	0.00011	
2 Керченский	46.3	26	2136.89	676.00	1203.78	12.038	13.34	0.29893	-0.03893	0.00151	0.01	0.00010	0.04893	0.0023
4 Ильичевский	25.8	18	665.64	324.00	464.40	4.644	21.5673	0.21182	-0.03182	0.00101	-0.07	0.00490	0.03818	0.00145
5 Итого	109.0	75	4170.94	16669.00	2057.78	28.121	297.33089	0.74991	-	0.00753	-	0.00860	-	0.00345

Table 4

Местность	Х	Y	X ²	Y ²	XY	(X - $\bar{X}$) ²	(Y - $\bar{Y}$) ²	(X - $\bar{X}$)(Y - $\bar{Y}$)	$\bar{X} - \bar{Y}$	$(\bar{X} - \bar{Y})^2$	$\bar{Y}X - \bar{Y}^2$	$(\bar{Y}X - \bar{Y}^2)^2$
2 Севастопольский	8.7	36.9	75.69	1360.41	321.03	279.1961	47.4919	-10.59199	0.57	0.32490	11.5855	134.556
3 Керченский	5.2	46.3	27.04	2142.76	240.76	125.952	34.2586	12.04014	9.97	99.40090	-2.07457	4.3031
4 Ильичевский	7.3	25.8	53.29	665.64	188.34	1374.882	27.3068	-1.50968	-10.53	110.88090	-9.0255	81.4625
5 Итого	21.2	109.0	118.128	9299.9618	750.13	5419.795	109.06153	-	-	259.43435	-	210.24495

Key: 1--Sevastopol; 2--Kerch; 4--Il'ichevsk; 5--Total

$\bar{Y}$ --the mean value equal to $\Sigma Y/n$;

$$\bar{Y} = \frac{0.75}{3} = 0.25.$$

The standard deviation $\bar{Y}_{sd}$ which characterizes the variability of the criterion Y can be determined using the data of Table 3:

$$Y_{sd} = \pm \sqrt{\frac{\Sigma(Y-\bar{Y})^2}{n}} = \sqrt{\frac{0.00860}{3}} = 0.00286 = \pm 0.05348.$$

The variability of the criterion $\bar{YX}$ can be determined by the formula

$$\bar{YX}_{sd} = \pm \sqrt{\frac{\Sigma(\bar{YX}-\bar{Y})^2}{n}} = \frac{0.00395}{3} = 0.00131 = \pm 0.0362.$$

The coefficient of the correlation ratio will equal

$$r = \frac{\bar{YX}_{sd}}{Y_{sd}} = \pm \frac{0.0362}{0.05348} = \pm 0.67688, \quad r^2 = 0.45816.$$

This means that 46 percent of the return on investment in the fishing seaports depends upon the proportional amount of the active part of the fixed productive capital, and 54 percent depends upon other factors.

The regression equation indicates that a 1 percent change in the proportional amount of the active part of the fixed productive capital of the fishing seaports leads to an increase or decrease in the return on investment by approximately 0.424 kopeck. Here each percentage of an increase in the proportional amount of the active part from 25.5 to 36.9 percent will increase the return on investment from 0.237 to 0.424 kopeck, while a rise in the proportional amount of this capital from 36.9 to 46.3 percent should be accompanied by an increase in the return on investment from 0.424 to 0.634 kopeck. Actually the highest level of the return on investment (0.31 ruble per ruble) of fixed productive capital in the Sevastopol' Fishing Seaport was achieved with a proportional amount of the active part of this capital equal to 36.9 percent. At the same time, in the Kerch' Fishing Seaport, with the proportional amount of the active part of the fixed productive capital equal to 46.3 percent (9.4 percent more than in Sevastopol'), a return on investment was achieved which was 5 kopecks lower than in Sevastopol'. Here one can clearly see the influence of the core of active elements in the fixed productive capital of the ports, that is, machinery and equipment. Regardless of the fact that in the Kerch' Fishing Seaport the proportional amount of the active part of fixed productive capital is the highest in comparison with the other ports (some 46.3 percent), the proportional amount of machinery and equipment is the lowest (5.2 percent).

Table 4 gives the calculated data for the dependence of the active part of fixed productive capital upon the proportional amount of machinery and equipment in it.

The mean square area of a parabolic regression equation, as above, can be determined from the formula:

$$\sigma_{\bar{YX}} = \sqrt{\frac{\sum(Y - \bar{YX})^2}{n}} = \sqrt{\frac{259.43435}{3}} = \sqrt{86.47811} = 9.3.$$

After calculating the coefficients, the equation of the curve assumed the form:

$$\bar{YX} = 243.71598 - 66.61511x + 5.06444x^2;$$

$\bar{Y}$ --the average value equal to $\sum Y/n$;

$$\bar{Y} = \frac{109.0}{3} = 36.33333.$$

From the equation let us determine the value of $\bar{YX}$ for each port.

The standard deviation which characterizes the variability of the Y criterion equals:

$$Y_{sd} = \pm \sqrt{\frac{\sum(Y - \bar{Y})^2}{n}} = \sqrt{\frac{210.60670}{3}} = \sqrt{70.20223} = \pm 8.38;$$

The variability of the $\bar{YX}$ criterion can be determined from the formula:

$$\bar{YX}_{sd} = \pm \sqrt{\frac{\sum(\bar{YX} - \bar{Y})^2}{n}} = \sqrt{\frac{210.24495}{3}} = \sqrt{70.08165} = 8.375.$$

Hence the coefficient of the correlation ratio equals:

$$r = \frac{\bar{YX}_{sd}}{Y_{sd}} = \frac{8.375}{8.380} = \pm 0.9994,$$

$$\text{and } r^2 = 0.9988.$$

0.9988 means that the return on investment of the fishing seaports is basically determined by the proportional amount of machinery and equipment in the active part of the fixed capital. In using the data of the solution, it is easy to calculate the influence of each percentage of increase of machinery and equipment in the active portion of the fixed capital on the return on investment, and to calculate the optimum amount of the leading group of the active portion of the fixed productive capital for each port. This is one of the possibilities of the correlation method in evaluating port operations and discovering existing reserves. As a whole, regression correlation analysis can provide great help to the economic services of the ports in seeking out the most rational ways for raising the use level of the fixed productive capital and production efficiency.

SOURCE: Izdatel'stvo "Pishchevaya promyshlennost'", "Rybnoye khozyaystvo", 1979

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